H.R.I.O.

HORTICULTURAL RESEARCH INSTITUTE OF ONTARIO

Research Report #41

MUCK VEGETABLE CULTIVAR TRIALS and RESEARCH REPORTS

1991

M.R. McDonald

S. Hovius

S. Janse

Ministry of Agriculture and Food
ONTARIO

Muck Research Station
Kettleby, Ontario

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RESEARCH AND CULTIVAR TRIAL REPORT FOR 1991

MUCK RESEARCH STATION, HOLLAND MARSH

R.R.# 1 KETTLEBY, ONTARIO, LOG 1JO

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INTRODUCTION AND ACKNOWLEDGEMENTS

Horticultural research and services programs for the fruit and vegetable industry of Ontario are the responsibility of the **Horticultural Research Institute of Ontario**, Ontario Ministry of Agriculture and Food. First established in 1906, this institute carries on its research efforts in four units: the Vineland Station, the Horticultural Products Laboratory, also situated at Vineland Station, the Horticultural Experiment Station at Simcoe and the Muck Research Station in the Holland Marsh.

The Muck Research Station, established in 1948, is responsible for conducting and coordinating all research projects directed towards solving problems in the production of vegetables grown in organic soils. The **Ontario Muck Crops Research and Services Committee (OMCRSC)** representing researchers, industry, growers and crop advisors, makes recommendations for research on an annual basis.

In 1991, Muck Research Station staff conducted and/or cooperated on research projects with researchers of the Departments of Environmental Biology and Horticultural Science at the University of Guelph; researchers from Agriculture Canada research stations at London and Vineland Station; the Ontario Pesticide Residue Testing Laboratory; researchers of the Horticultural Products Laboratory (H.R.I.O.). at Vineland Station, research departments of the Crop Protection Chemical Industry and Growers.

The station also provides Advisory Services to growers and the general public in regard to production and marketing of horticultural crops.

The Pest Management Program for growers in the Bradford area is managed by the Plant Industry Branch in cooperation with the Bradford and District Vegetable Growers' Association. Intensive pest monitoring is available to vegetable producers on a fee for service basis.

This report highlights the research projects which were conducted in 1991. The results published in this report should be treated as a progress report. Some of the chemicals used in the trials are not registered for use on the crops they were applied to. Additional trials may be necessary before any firm conclusions and recommendations can be given.

I would like to take this opportunity to express my sincere appreciation to the staff for their efforts in conducting these trials and producing this report. My thanks also to all the cooperating researchers and technicians for their interest in muck crops.

Mary Ruth McDonald
Research Scientist, Muck Crops

SEED SOURCES - 1991

We wish to express our sincere thanks to all those who provided us with seed for trials.

A&C	Abbott & Cobb Inc., Box 307, Feasterville, Pennsylvania, U.S.A. 19047.
A.Ch.	Alf. Christianson Seed Co., Box 98, Mount Vernon, Washington, U.S.A. 98273.
Aris	Aristogenes Inc., 23723 Fargo Road, Idaho, U.S.A. 83660.
Asg	Asgrow Seed Co., Box 610, Bradford, Ontario, Canada L3Z 2B2.
BEJO	BEJO ZADEN, Postbus 50, 1749 ZH Warmenhuizen, Holland
BO	Brinker-Orsetti Seed Co., 771-A Freedom Blvd, Watsonville, California, U.S.A. 95076.
Cro	Crookham Company, Box 520, Caldwell, Idaho, U.S.A. 83606.
CS	Campbell Soup Co., Box 280, Chatham, Ontario, Canada N7M 5K4.
E.J.	Erie James Ltd., Box 457, Leamington, Ontario, Canada N8H 3W5.
FAIR	Fairbanks Selected Seed Co., Ltd., Box 35 "Fersh Centre" 542 Footscray Road, Footscray, Victoria, 3011 Australia.
FM	Ferry-Morse Seed Co., Box 431, Orchard Park, New York, U.S.A. 14127.
Gab	W. Gabelman, University of Wisconsin, 1575 Linden Drive, Madison, Wisconsin, U.S.A. 53706.
HM	Harris Moran Seeds of Canada, R.R. # 1 Kettleby, Ontario, Canada LOG 1JO.
HY	Hyland Seeds, Division of W.G. Thompson & Sons Ltd., P.O. Box 250 Blenheim, Ontario NOP 1AO.
JHK	J.H. Klitgord, Box 87, R.D. # 2 Mayville, New York, U.S.A. 14757.
Jung	J.W. Jung Seed Co., Randolph, Wisconsin, U.S.A. 53956.
NK	Northrup King & Co., Box 1827, Gilroy, California, U.S.A. 95021.
NUN	Nunheim's Zaden B.V., Box 4005, 6080 AA, Haelen, Holland.
NZ	Nickerson-Zwaan B.V., Box 1787, Gilroy, California, U.S.A. 95021.

OE	J.E. Ohlsen Enke, Box 15, Aalokke Alle 5-7, DK-5100, ODENSE C, Denmark.
PES	Peter-Edward Seed Co., 302 South Center St., Eustris, Florida, U.S.A. 32726.
PETO	Petoseed Co., Box 4206, Saticoy, California, U.S.A. 93004.
Ris	Martin Rispens & Son, Inc., P.O. Box 5, Lansing, Illinois, U.S.A. 60438.
RS	Royal Sluis Inc., 1293 Harkins Rd., Salinas, California, U.S.A. 93901.
Sak	Sakata Seed America Inc., 18095 Serene Dr., Morgan Hill, California, U.S.A. 95037.
Sham	Shamrock Seed Co., Box 4443, Salinas, California, U.S.A. 93912.
Sieg	Siegers Seed Co., 8265 Felch Street Zeeland, Michigan, U.S.A. 49464.
Sto	Stokes Seeds Ltd., 39 James St., Box 10, St. Catharines, Ontario, Canada L2R 6R6.
Sun	Sun Seeds, 8850 59th Avenue N.E. Brooks, Oregon, U.S.A. 97305.
Swy	Seedway Inc., Hall, New York, U.S.A 14463.
Tak	American Takii Inc., 301 Natividad Road, Salinas, California, U.S.A. 93906.
Toz	A.L. Tozer Ltd., Cobham. Surrey, England KT11-3EH.
Twi	O.S. Twilley Seeds Co., Box 65, Trevose, Pennsylvania, U.S.A. 19047 .
UW	University of Wisconsin, Dept. of Horticulture, 1575 Linden Drive, Madison, Wisconsin, U.S.A. 53706.
VDH	Vanderhave, Box 1, 4410AA, Rilland, Holland.
Vil	Vilmorin Inc., 6104 Yorkshire Ter., Bethesda, Maryland, U.S.A. 20814.
WR	Winds of Riga Produce, P.O. Box 410, Churchville, New York, U.S.A. 14428.
W.H.P.	W.H. Perron & Co. Ltd., 2914 Labelle Blvd., Chomedey Laval, Quebec. H7P 5R9.
ZW	Zwaan Seeds, Inc., P.O. Box 397, Route 45, Woodstown, New Jersey, U.S.A. 08098-0397.

STAFF - 1990-91

MUCK RESEARCH STATION - H.R.I.O.

Mary Ruth McDonald, P.Ag.,	**Officer-in-Charge Research Scientist, Muck Crops**
Sid Hovius	Agricultural Technician
Shawn Janse	Agricultural Technician
Veronica Horlings	Labourer
Dan Fulton	Experience '91 Student
Patricia Flinn	Office Administration Group
Trudy Roberts	Office Administration Group
Theo Lewis	Environmental Youth Corp

COOPERATING RESEARCH STAFF - EDUCATION/RESEARCH/GOVERNMENT

Greg Boland	Environmental Biology, Univ. of Guelph
Elizabeth Smith	Environmental Biology, Univ. of Guelph
Melody Melzer	Environmental Biology, Univ. of Guelph
Ray Cerkauskus	Agriculture Canada, Vineland Station
Gwen Ritcey	Environmental Biology, Univ. of Guelph
Theo Olthof	Agriculture Canada, Vineland Station
Daniel Cormier	Entomology, McGill University
John Sutton	Environmental Biology, Univ. of Guelph
Kit Nelson	Environmental Biology, Univ. of Guelph
Richard Smith	H.P.L. - H.R.I.O., Vineland Station
Vince Souza Machado	Horticultural Science, Univ. of Guelph
Ahmed Ali	Horticultural Science, Univ. of Guelph
Rodger Tschanz	Horticultural Science, Univ. of Guelph
A.B. "Steve" Stevenson	Agriculture Canada, Vineland Station
Ed Barsz	Agriculture Canada, Vineland Station
Vanessa Currie	Horticultural Science. Univ. of Guelph

COOPERATING RESEARCH STAFF - INDUSTRY/PRIVATE SECTOR

George Annette	Cyanamid Canada, Guelph, Ontario
Brenda Harris	Cyanamid Canada, Markham, Ontario
Irwin Schmidt	United Agri Products, Dorchester, Ontario
Doug Goudy	ISK-Biotech, Lucan, Ontario
Denis Rodet	Dupont Canada, Lindsay, Ontario

INTERGRATED PEST MANAGEMENT PROGRAMS

MUCK CROPS - P.I.B.

Jim Chaput, M.Sc.	Pest Management Advisor

POTATOES - P.I.B.

Eugenia Banks, Ph.D.	Pest Management Advisor

P.I.B.

Susan Delafield, M.Sc.	Lab. Technician

SUNSHINE HOURS

Month	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	LTA
January	108	82	53	68	52	71	67	93	93	70	98	77
February	81	102	102	66	60	85	145	94	108	99	113	101
March	102	130	115	135	141	124	174	151	125	90	140	132
April	158	219	117	152	171	162	194	137	169	164	146	168
May	221	199	186	164	235	222	240	236	192	176	252	221
June	245	170	296	335	240	258	253	304	196	233	336	241
July	265	303	295	268	271	252	295	280	340	280	262	280
August	201	225	226	218	207	217	256	243	215	208	260	228
September	119	138	195	168	181	112	145	185	185	132	189	162
October	106	126	141	105	145	129	114	96	142	142	128	124
November	116	61	49	77	37	94	103	48	73	105	71	76
December	33	35	50	39	62	38	67	86	82	83	81	59
Total Hours	**1755**	**1790**	**1825**	**1795**	**1802**	**1764**	**2053**	**1953**	**1920**	**1782**	**2076**	**1869**

LTA - Long Term Average for Muck Research Station, Kettleby,
16 Years - (1976-1991)

GROWING DEGREE DAYS (5°C Base)

Month	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	LTA
January	0	0	0	0	0	0	0	0	1	0	0	0
February	0	0	0	6	0	0	0	0	0	1	2	1
March	18	6	14	0	7	45	26	13	6	42	13	13
April	86	67	44	82	129	96	129	49	31	139	126	81
May	180	301	165	163	243	295	276	273	230	189	344	243
June	377	320	377	413	303	339	407	358	389	397	453	345
July	467	485	521	473	439	472	516	531	458	460	480	473
August	429	378	480	507	401	383	427	481	409	435	474	432
September	274	288	328	254	333	276	307	292	310	284	269	283
October	48	143	131	175	139	123	62	70	161	134	164	115
November	19	49	23	28	31	14	30	28	20	53	17	31
December	0	32	0	10	0	0	3	0	0	3	2	3
Annual	1898	2069	2083	2111	2025	2043	2183	2095	2015	2137	2344	2020

LTA = Long Term Average for Muck Research Station, R.R. # 1 Kettleby, Ontario, LOG 1J0
17 Years (1975-1991)

PRECIPITATION

Month	1981		1982		1983		1984		1985		1986	
	Rain mm	Snow cm	Rain mm	Snow cm	Rain mm	Snow cm	Rain mm	Snow cm	Rain mm	Snow cm	Rain mm	Snow cm
January	0	33	5	54	29	7	0	56	16	29	0	35
February	37	21	0	35	28	6	24	53	63	37	16	33
March	24	13	30	31	34	12	33	18	47	3	34	19
April	36	0	22	11	75	4	46	0	42	8	37	3
May	80	0	42	0	88	0	104	0	77	0	88	0
June	71	0	141	0	29	0	61	0	43	0	120	0
July	88	0	80	0	65	0	36	0	72	0	95	0
August	84	0	71	0	90	0	81	0	158	0	166	0
September	89	0	73	0	46	0	98	0	59	0	209	0
October	75	17	47	0	75	0	39	0	73	0	47	0
November	67	6	101	7	50	24	64	0	75	28	14	17
December	5	43	58	22	11	41	22	19	0	17	25	35
Annual	**656**	**133**	**670**	**160**	**620**	**94**	**608**	**146**	**725**	**122**	**851**	**142**
Total Precip.	**789**		**830**		**714**		**754**		**847**		**993**	

LTA = Long Term Average for Muck Research Station, R.R. # 1 Kettleby, Ontario, LOG 1JO
17 Years (1975-1991).

PRECIPITATION

Month	1987		1988		1989		1990		1991		LTA	
	Rain mm	Snow cm	Rain mm	Snow cm	Rain mm	Snow cm	Rain mm	Snow cm	Rain mm	Snow cm	Rain mm	Snow cm
January	0	37	18	5	15	12	12	16	5	22	12	31
February	6	5	3	46	0	19	45	29	2	11	18	24
March	37	16	21	1	9	26	41	0	49	6	36	15
April	48	3	57	0	37	20	51	3	102	3	54	5
May	60	0	43	0	102	0	77	0	57	0	70	0
June	112	0	38	0	93	0	145	0	35	0	74	0
July	189	0	48	0	54	0	65	0	98	0	86	0
August	81	0	91	0	100	0	51	0	62	0	92	0
September	69	0	84	0	102	0	88	0	32	0	88	0
October	66	0	79	2	61	0	114	2	63	0	70	0
November	41	43	69	0	68	5	31	12	27	8	52	11
December	23	11	24	13	2	18	44	38	14	27	23	27
Annual	**732**	**115**	**575**	**67**	**643**	**100**	**764**	**100**	**546**	**77**	**675**	**113**
Total Precip.	**847**		**642**		**743**		**864**		**623**		**788**	

LTA = Long Term Average for Muck Research Station, R.R. # 1 Kettleby, Ontario, LOG 1JO
17 Years (1975-1991).

MEAN TEMPERATURE (^{o}C)

Month	1981		1982		1983		1984		1985		1896	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
January	- 7.0	-17.4	- 6.2	-15.8	- 2.0	- 7.9	- 6.4	-14.7	- 5.7	-13.3	-3.2	-10.6
February	0.9	- 6.6	- 3.9	-12.6	- 0.3	- 7.4	1.6	- 5.9	- 3.1	-10.8	-4.1	-11.7
March	3.3	- 5.1	- 1.9	- 6.6	3.9	- 4.1	- 0.8	-10.4	3.9	- 4.7	5.1	-4.1
April	11.6	2.1	9.9	- 1.1	9.7	0.3	12.5	1.5	13.2	2.4	13.3	1.7
May	17.0	4.4	21.1	8.5	15.3	5.0	15.8	4.4	19.2	6.4	20.3	8.4
June	23.7	11.5	20.6	10.8	25.2	10.0	25.8	11.7	21.1	9.1	22.5	9.8
July	26.0	14.1	26.8	14.4	28.6	14.7	26.7	13.5	25.5	12.9	25.7	14.8
August	24.5	13.0	23.0	11.4	26.0	14.3	27.6	15.2	23.8	12.1	23.3	11.4
September	18.4	9.8	20.1	9.1	22.5	9.2	18.8	7.9	21.9	10.1	19.1	9.3
October	10.6	1.7	15.2	3.6	13.7	3.5	15.6	5.5	14.1	4.4	13.1	4.3
November	6.8	- 1.5	6.9	0.4	5.1	- 1.7	6.4	- 1.4	4.9	- 0.4	4.5	-2.4
December	- 1.0	- 7.0	3.3	- 3.6	- 4.0	- 9.8	3.6	- 3.7	- 2.5	- 9.0	0.4	-4.5
Mean	**11.2**	**1.6**	**11.3**	**1.5**	**12.0**	**2.2**	**12.3**	**2.0**	**11.4**	**1.6**	**11.7**	**2.2**

LTA = Long Term Average for Muck Research Station, R.R. # 1 Kettleby, Ontario, LOG 1JO
17 Years (1975-1991).

MEAN TEMPERATURE (^{o}C)

Month	1987		1988		1989		1990		1991		LTA	
	Max.	Min.	Max.	Min.	Max	Min	Max	Min	Max	Min	Max	Min
January	- 2.1	- 8.8	- 1.7	- 10.5	1.2	- 7.4	1.6	- 4.2	-3.3	- 11.3	- 3.0	- 11.7
February	- 1.8	-12.7	- 3.0	- 11.9	- 3.8	- 11.7	- 1.0	- 7.9	1.1	- 7.1	- 1.5	- 10.4
March	5.8	- 4.2	- 3.4	- 6.1	0.5	- 7.9	4.9	- 3.4	4.4	- 3.1	2.4	- 5.5
April	14.4	2.8	10.5	0.8	8.7	0.7	13.4	3.4	13.1	4.1	11.3	1.3
May	20.6	7.2	20.7	6.9	18.4	19.0	16.9	5.8	22.3	9.9	19.0	6.7
June	25.1	12.0	24.3	9.5	23.2	12.3	23.6	12.9	25.5	12.6	23.5	10.9
July	27.6	15.7	29.5	14.6	27.1	12.5	26.0	13.7	26.9	14.0	26.7	14.0
August	24.5	13.1	26.7	14.3	24.4	11.6	25.4	12.7	26.8	13.8	25.1	12.9
September	20.4	10.0	20.7	8.8	20.8	9.9	20.0	8.9	20.6	7.0	20.0	9.0
October	11.5	2.0	10.5	2.1	15.5	3.5	14.2	3.5	14.9	5.1	13.0	3.5
November	6.7	- 1.4	7.2	0.9	4.3	- 3.4	8.4	- 0.8	5.0	- 2.3	6.2	- 0.9
December	1.4	- 3.8	- 0.3	- 7.8	-7.6	-15.9	1.3	- 5.5	0	- 6.7	-0.9	- 7.4
Mean	**12.8**	**2.7**	**12.4**	**1.8**	**11.1**	**1.9**	**12.9**	**3.3**	**13.1**	**3.0**	**11.8**	**1.9**

LTA = Long Term Average for Muck Research Station, R.R. # 1 Kettleby, Ontario, LOG 1JO
17 Years (1975-1991).

EXTREME TEMPERATURES (°C)

Month	1981		1982		1983		1984		1985		1986	
	H	L	H	L	H	L	H	L	H	L	H	L
January	6.5	-33.5	4.5	-30.5	4.5	-20.0	1.0	-33.0	- 1.0	-29.5	7.0	-26.0
February	10.0	-26.0	5.0	-28.0	10.0	-23.0	14.5	-28.0	8.5	-28.5	2.0	-23.0
March	19.0	-17.5	17.0	-25.0	14.5	-20.5	9.5.	-29.0	16.5	-19.0	24.0	-24.0
April	21.0	- 6.0	22.0	-14.0	24.0	- 6.0	27.0	- 5.0	29.5	- 8.0	25.0	- 5.5
May	27.0	- 3.5	28.0	0	23.0	- 2.5	28.0	- 3.0	27.0	- 1.5	31.0	- 3.0
June	34.0	- 1.0	25.5	2.0	33.5	- 1.0	32.5	2.5	27.0	1.5	32.0	0
July	32.0	6.0	33.0	6.5	34.5	5.0	33.5	2.5	31.0	6.0	32.5	5.0
August	29.5	4.0	30.5	0.5	31.5	5.0	32.5	4.0	30.5	5.5	29.0	2.5
September	27.0	- 2.5	30.0	- 0.5	30.5	0	26.5	- 2.0	30.0	1.0	26.0	- 0.5
October	17.0	- 5.0	23.0	- 4.0	26.0	- 7.0	21.0	- 3.5	20.0	- 6.0	21.5	- 5.0
November	17.0	-12.0	18.0	- 9.5	17.0	-11.5	20.0	-11.0	18.5	- 7.0	15.0	-12.0
December	5.0	-19.0	20.0	-18.5	3.0	-22.5	16.0	- 1.5	6.5	-25.5	3.0	-19.0
Annual	**34.0**	**-33.5**	**33.0**	**-30.5**	**34.5**	**-23.0**	**33.5**	**-33.0**	**31.0**	**-29.5**	**32.5**	**-26.0**

LTA = Long Term Average for Muck Research Station, R.R. # 1 Kettleby, Ontario, LOG 1JO
17 Years (1975-1991).

EXTREME TEMPERATURES (°C)

Month	1987		1988		1989		1990		1991		LTA	
	H	L	H	L	H	L	H	L	H	L	H	L
January	4.5	-25.0	12.0	- 28.0	10.0	- 25.0	9.0	- 16.0	3.0	- 25.0	12.0	- 36.0
February	3.0	-26.5	6.5	- 22.0	5.0	- 27.0	10.0	- 21.5	10.0	- 22.0	14.5	- 33.0
March	17.0	-16.0	15.0	- 18.0	21.0	- 24.0	22.0	- 16.0	13.5	- 11.5	24.0	- 29.0
April	27.5	- 9.0	18.5	- 4.0	18.0	- 5.5	30.0	- 4.5	26.5	- 5.0	30.0	- 14.0
May	32.0	- 4.0	32.0	- 0.5	29.0	- 1.0	25.0	- 2.0	30.5	0	32.0	- 4.0
June	32.5	30.0	35.5	0	30.0	6.0	30.0	3.0	33.5	5.5	35.5	- 2.0
July	33.0	8.5	36.0	5.0	32.5	3.5	34.0	7.0	33.0	8.0	36.0	2.5
August	32.0	6.0	34.5	4.0	32.0	2.5	31.5	6.0	33.5	7.5	36.0	0.5
September	28.0	1.0	28.0	0	29.0	- 1.5	29.0	- 0.5	31.0	- 6.5	31.0	- 6.5
October	20.0	- 5.0	25.5	- 6.0	30.0	- 5.0	25.5	- 7.0	24.5	- 5.5	30.0	- 9.0
November	14.5	-17.0	15.5	- 5.0	17.0	- 18.5	24.0	- 7.5	16.5	-13.0	24.0	-22.0
December	12.0	-18.0	10.0	- 24.0	3.0	- 28.0	11.0	- 16.5	12.0	-21.0	20.0	-31.5
Annual	**33.0**	**-26.5**	**36.0**	**- 28.0**	**32.5**	**- 28.0**	**34.0**	**- 21.5**	**33.5**	**-25.0**	**36.0**	**-36.0**

LTA = Long Term Average for Muck Research Station, R.R. # 1 Kettleby, Ontario, LOG 1JO
17 Years (1975-1991).

CULTIVAR EVALUATION OF CAVITY SPOT DEVELOPMENT IN STORAGE

CROP: Carrots cv. Chancellor, XPH 3507, Cellobunch, Six Pak

PEST: Cavity spot. *Pythium spp.*

METHOD: The trial was conducted in naturally-infested soil at the Muck Research Station. The four cultivars were seeded on two seeding dates, June 7 and July 9, 1990, at 55 cm row spacing, three rows per replicate and arranged in a randomized complete block arrangement with four replicates. On November 19, 1990 the treatments were harvested and placed in a Filacell cooler where the temperature was held at $1^0C \pm 1^0$ and relative humidity at 90% ± 2%. Cavity spot severity was rated on December 21, 1990 based on the vertical width of the largest lesion. The scale was 0 = no lesions, 1 = < 1 mm, 2 = 1-2 mm, 3 = 2-5 mm, 4 = 5-10 mm and 5 = > 10 mm. Disease severity was calculated as:

$$\frac{\text{sum of (\# of carrots per class x value of class)}}{\text{Total number of carrots x 5}} \times 100$$

After the initial rating, the carrots were placed back into storage and were evaluated again on April 17, 1991.

RESULTS: As presented in the tables below.

CONCLUSIONS: In 1990, delaying seeding for one month had no effect on the severity of cavity spot in storage (Table 1). On December 21, 1990, there was no difference in cavity spot severity among cultivars. By April 17, 1991, cavity spot was significantly higher in cv. XPH 3507 than in cv. Six Pak. Cultivars Chancellor and Cellobunch seeded in June also had significantly less cavity spot than cv. XPH 3507. Seeding date did not significantly affect cavity spot within a cultivar. The severity of cavity spot increased in storage from December to April (Table 2). Disease severity increased the most in susceptible cv. XPH 3507 and least in tolerant cv. Six Pak. Cavity spot severity of cv. XPH 3507 in December was equivalent to that of cv. Six Pak in April.

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CULTIVAR EVALUATION OF CAVITY SPOT DEVELOPMENT IN STORAGE - continued

Table 1. Effect of seeding date on cavity spot development on several carrot cultivars.

Cultivar	Seeding Date	Disease Severity (%) December 21/90	Disease Severity (%) April 17/91
Chancellor	June 7/90	36.0 a *	43.9 b
	July 9/90	35.3 a	49.4 ab
XPH 3507	June 7/90	39.4 a	54.1 a
	July 9/90	34.8 a	55.9 a
Cellobunch	June 7/90	33.1 a	45.5 b
	July 9/90	35.4 a	49.6 ab
Six Pak	June 7/90	31.6 a	42.7 b
	July 9/90	31.9 a	43.3 b

* Numbers in a column followed by the same letter are not significantly different at P = 0.05, Protected L.S.D. Test. L.S.D. Table 1 = 8.262

Table 2. Cultivar effect on cavity spot development in storage.

Cultivar	Evaluation Date	Disease Severity (%)
Chancellor	December 21/90	35.6 a *
	April 17/91	46.6 c
XPH 3507	December 21/90	37.2 ab
	April 17/91	55.0 d
Cellobunch	December 21/90	34.2 a
	April 17/91	47.6 c
Six Pak	December 21/90	31.6 a
	April 17/91	42.7 bc

* Numbers in a column followed by the same letter are not significantly different at P = 0.05, Protected L.S.D. Test. L.S.D. Table 2 = 5.6229

PASTEURIZATION OF SOIL FOR THE CONTROL OF RUSTY ROOT, PYTHIUM ROOT DIEBACK

CROP: Carrots cv. Caropak

PEST: Rusty Root, Pythium spp.

MATERIALS: Lansa Soil Pasteurizer - Volume 1.5 bushels

METHODS: Naturally-infested muck soil from two locations in the Holland Marsh plus soil from the Muck Research Station were divided into pasteurized and non-pasteurized treatments. Carrots grown in the field on Site 2 had severe symptoms of rusty root, where carrots grown in the other fields did not. Soil was pasteurized for 40 minutes at 46^{0}C. There were 6 treatments; 2 treatments per soil type. Eight 6 L pots per treatment was seeded with 20 carrot seeds per pot. Ten days after seeding, emergence was recorded. Three weeks after seeding, 4 pots per treatment were harvested and evaluated. The remaining 4 pots per treatment were thinned to 5 carrots per pot and grown for 8 more weeks. On June 5, 1991 the remaining pots were harvested and rated for rusty root. During the final 8 weeks of growing, the pots were saturated with water at all times.

RESULTS: As presented in the table below.

CONCLUSION: Pasteurizing soil greatly reduced the percent damage caused by Rusty Root three weeks after seeding. However, only carrots growing in non-pasteurized soil from one location showed damage when allowed to mature, indicating that carrots can "grow-out" of the rusty root symptoms when grown in soil that is not heavily infested.

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PASTEURIZATION OF SOIL FOR THE CONTROL OF RUSTY ROOT, PYTHIUM ROOT DIEBACK - continued

Treatment	Percent Emergence	April 10, 1991 Percentage Roots Damaged	April 10, 1991 Rusty Root Rating **	June 5, 1991 Percentage Roots Damaged	June 5, 1991 Rusty Root Rating
M.R.S. soil pasteurized	67.5	3.7 ab *	4.3 ab	0.0 a	5.0 a
M.R.S. soil	75.0	18.7 cd	2.7 c	0.0 a	5.0 a
Site 1 pasteurized	71.5	12.6 bc	3.3 bc	0.0 a	5.0 a
Site 1 soil	66.5	0.0 a	5.0 a	10.0 a	4.9 a
Site 2 soil pasteurized	71.5	0.0 a	5.0 a	9.3 a	4.9 a
Site 2 soil	77.5	25.8 d	2.0 c	33.8 b	3.7 b

* Numbers in a column followed by the same letter are not significantly different at P = 0.05, Protected L.S.D. Test.

** Legend: 5.0 = No Damage 1.0 = Heavy Damage

EVALUATION OF VARIOUS FUNGICIDES FOR THE CONTROL OF SCLEROTINIA ON CARROTS IN STORAGE

CROP: Carrots cv. Caropak

PEST: Sclerotinia white mold, Sclerotinia sclerotiorum (Lib.) de Bary

MATERIALS: BOTRAN 75W (dichloran), BENLATE 50 WP (benomyl), BRAVO 40.4% (chlorothalanil), ROVRAL 50 WP (iprodione), JAVEX 6% (Sodium hypochlorite)

METHODS: On May 24, 1990, carrots were seeded in naturally-infested soil at the Muck Research Station. Field treatments were applied September 6, September 19, and October 1, 1990 using a solid cone spray nozzle at 65 p.s.i. and 350 litres of water per hectare. Plots were 2 rows wide, 5 m in length and replicated 4 times in a randomized complete block arrangement.

Approximately 10 kg of carrots from each plot were harvested on October 24, 1990 plus one extra 10 kg sample from each of the check plots for the Javex drench. Drench samples were washed and immersed in treatment solution for 5 seconds. All samples were placed in plastic containers and put in a filacell cooler where the temperature and humidity were kept at approximately 1.0^{0}C and 90% respectively.

On January 28 and April 11, 1991 the number of carrots with and without visible white mold were counted and percent disease and degree of disease were calculated.

RESULTS: As presented in the table below.

CONCLUSIONS: Fungicide applications in the field did not control Sclerotinia white mold in storage. The iprodione dip plus field applications, did provide the best overall control. The use of a Javex drench actually increased the degree of sclerotinia mold. No treatments were statistically different from the untreated check on the final evaluation date, April 11, 1991.

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EVALUATION OF VARIOUS FUNGICIDES FOR THE CONTROL OF SCLEROTINIA ON CARROTS IN STORAGE - continued

Treatment	Field Appli. kg/ha	Post-Harvest Dip per L/H^2O	January 28 % Disease*	January 28 Degree of Disease	April 11 % Disease	April 11 Degree of Disease
BOTRAN drench	3.3	1.67 g	9.25 abc**	4.4 a	11.90 ab	4.0 ab
BENLATE	0.75	-	9.10 abc	4.2 a	18.70 bc	3.5 ab
BRAVO	0.60 L	-	15.90 cd	3.7 a	22.50 c	3.3 ab
ROVRAL	1.0	-	12.50 bc	3.9 a	20.60 bc	3.3 ab
Javex drench	-	1.0 ml	22.40 d	3.2 a	35.18 d	2.3 b
ROVRAL drench	1.0	1.0 g	3.75 a	4.2 a	5.30 a	4.3 a
BOTRAN	3.3	-	12.60 bc	3.4 a	22.22 c	3.0 b
Check	-	-	7.00 ab	4.1 a	9.00 a	3.5 ab

* Degree of Disease - 5.0 = No Disease, 3.7 = Moderate, 1.0 = Severe (liquidified)

** Numbers in a column followed by the same letter are not significantly different at P = 0.05, Protected L.S.D. Test.

THE USE OF WOOD MULCH FOR THE CONTROL OF WEED PRESSURE, SCLEROTINA AND DIRT IN HEADS OF LETTUCE

The lettuce cultivar, Ithaca was transplanted into naturally-infested organic soil at th MUCK Research Station on May 23, 1991. Row spacing was 40 cm with 30 cm between plants and length of rows was 5 m. There were 4 treatments:

1. Hills without mulch
2. Hills with mulch
3. Flat surface with mulch
4. Flat surface without mulch.

The treatments were replicated four times in a randomized complete block arrangement. The mulch consisted of fine wood chips of 2.5 cm and smaller. The mulch was applied on May 23 after transplanting. The weedings took place on June 4, 14 and 27 both treatments with mulch had lower weed pressure; an average of 30 weeds per square foot. The two treatments without mulch had an average of 46 weeds per square foot. The mulch did suppress weed growth, however, because the soil cannot be worked mechanically smaller weeds escape. The flat surface mulch suppressed the weeds the best due to lack of movement of the fine wood chips. The mulch on hills tended to move downward due to environmental conditions, i.e. wind, etc. The lettuce plants were harvested on July 5 and rated for Sclerotina and amount of muck soil in the head. Due to the dry weather conditions, the presence of Sclerotia and dirt in the head were not significantly different.

In 1992, this trial will be repeated to evaluate Sclerotinia and dirt in the head. Any effects of wood chips on nitrogen levels in the soil will also be assessed.

EFFICACY OF FUNGICIDES FOR THE CONTROL OF SCLEROTINIA DROP OF LETTUCE

CROP: Lettuce, cv. Ithaca

PEST: Lettuce drop, Sclerotinia sclerotiorum (Lib.) de Bary and Sclerotinia minor Jagger

MATERIALS: DITHANE M-22 (maneb 80%)
DITHANE M-45 (mancozeb 80%)
ROVRAL (iprodione 50%)

METHODS: The lettuce was seeded in Plastomer trays in the greenhouse on April 12, 1991. Lettuce plants were transplanted into naturally-infested organic soil at the Muck Research Station on May 16. A randomized complete block arrangement with 4 blocks per treatment was used. Each replicate consisted of 8 rows, 5 meters in length. The ROVRAL was applied at 1.125 kg/ha on June 1 and 14. The DITHANE M-22 and DITHANE M-45 was applied at 2.25 kg/ha on June 1, 14 and 21. The number of heads infected with Sclerotinia was assessed at harvest. 25 heads per treatment were harvested on July 2.

RESULTS: As presented in the table below.

CONCLUSIONS: The level of Sclerotinia infection was not high enough to adequately assess the efficacy of these fungicides. All fungicides increased the percentage of marketable heads that were harvested.

Harvest Date	Treatments	Rate kg/ha	Percent Marketable	Percent Sclerotinia
July 2	Check		71 a *	1 a
	DITHANE M-22	2.25	88 a	2 a
	ROVRAL	1.12	84 a	1 a
	DITHANE M-45	2.25	88 a	0 a

* Numbers in a column followed by the same letter are not significantly different at P = 0.05, Protected L.S.D. Test.

EVALUATION OF FUNGICIDES FOR THE CONTROL OF WHITE ROT OF ONIONS ON MUCK SOILS

CROP: Onions cv. Bingo

PEST: White Rot, Sclerotium cepivorum Berk.

MATERIALS: BOTRAN 75W (dichloran) 3.5 kg/ha product, BRAVO 500 (chlorothalonil) 3.2 L/ha product, FUNGINEX 190 EC (triforine) 3.0 L/ha product, **fluazinam** 0.56 kg ai/ha, **flusilazole** 35.0 g ai/ha.

METHODS: Plots were established on three farms with known histories of white rot in the Holland Marsh area and on a 12 m x 10 m plot artificially infested with white rot sclerotia (605 sclerotia/0.5 g soil) at the Muck Research Station (M.R.S.).

The farm plot sizes 11.76m^2. In the white rot plot at the M.R.S., the onions were planted with a V-belt seeder in 7 m rows spaced 42 cm apart. All treatments were replicated four times and arranged in a randomized complete block arrangement. Treatments used in the fields off station were: untreated check, BOTRAN drench, BRAVO drench, **fluazinam**, **flusilazole**, FUNGINEX and rogueing. Treatments in the M.R.S. plot were **fluazinam**, **flusilazole** and untreated check. Soil samples were taken with a tube soil sampler from each treatment and replicate before application of fungicides.

The wet sieving technique as described by P. Oudemans, 1984, was used to count the number of sclerotia in each sample. Fungicides were applied with a back pack sprayer directed at the base of the plant on June 26, July 16 and August 7. After first application of fungicides, the plots were visited weekly and infected plants were removed from rogueing treatments. The onions were pulled, counted and rated for white rot August 14 from Site 1, August 21 from Site 2, August 22 from Site 3 and September 20 from the M.R.S. A second set of soil samples was taken from plots after the onions were pulled. These samples were also counted for the number of sclerotia.

RESULTS: As presented in the table below.

CONCLUSIONS: The presence of sclerotia in soil is not a good indication of the amount of white rot that will develop in a season. When sclerotia was found in a soil sample, white rot always developed. However, when no sclerotia were found, white rot developed in 0-75% of the plots. Due to a very hot, dry summer, disease incidence was low throughout the plots and there were no significant differences found between the plots treated with fungicides, the untreated check, or rogueing treatments. The timing of the fungicide applications should be studied further.

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EVALUATION OF FUNGICIDES FOR THE CONTROL OF WHITE ROT OF ONIONS ON MUCK SOILS - continued

Treatment	Rate ai/ha	SITE 1 Sclerotia/g Spring	SITE 1 Sclerotia/g Fall	SITE 1 % Onion Infection	SITE 2 Sclerotia/g Spring	SITE 2 Sclerotia/g Fall	SITE 2 % Onion Infection
Check	-	0	0	1.72 a *	0	0	0 a
Rogueing	-	0	0	0.60 a	0	0	0.62 a
BRAVO Drench	1.6 kg	0	0	1.72 a	0	0	1.47 a
BOTRAN Drench	2.6 kg	0	0	1.10 a	0	0	0.65 a
fluazinam	0.6 kg	0	0	1.30 a	0	0	0.40 a
flusilazole	35.0 g	0	0	0.87 a	0	0	0 a
FUNGINEX	0.6 kg	0	0	0.90 a	0	0	0.42 a

* Numbers in a column followed by the same letter are not significantly different at P = 0.05, Protected L.S.D. Test.

Continued ...

Treatment	Rate ai/ha	SITE 3 Sclerotia/g Spring	SITE 3 Sclerotia/g Fall	SITE 3 % Onion Infection	M.R.S. SITE Sclerotia/g Spring	M.R.S. SITE Sclerotia/g Fall	M.R.S. SITE % Onion Infection
Check	-	0	0.05	1.84 a *			
Rogueing	-	0	0	1.29 a			
BRAVO Drench	1.6 kg	0.05	0	0.60 a			
BOTRAN Drench	2.6 kg	0	0.05	1.40 a			
fluazinam	0.6 kg	0	0	1.62 a	0.25	0.40	4.27 a
flusilazole	35.0 g	0	0	1.60 a	0.25	0.35	3.10 a
FUNGINEX	0.6 kg	0.1	0	0.50 a	0.25	0.35	4.15 a

* Numbers in a column followed by the same letter are not significantly different at P = 0.05, Protected L.S.D. Test.

MOLASSES AND AGRI-KELP TREATMENTS AS AN ALTERNATIVE TO REGULAR FUNGICIDES IN ONIONS

CROP: Onions, cv. Taurus

PEST: Botrytis Leaf Blight

MATERIALS: ZINEB 80 W, BOTRAN 75 W (dichloran), AGRI-KELP and molasses

METHODS: The onions were seeded into naturally infested organic soil at the Muck Research Station on May 1, 1991. A randomized complete block arrangement with 4 blocks per treatment was used. Each replicate consisted of 8 rows, 5 meters in length. Treatments were applied as a foliar spray with an Enti field sprayer at 65 p.s.i. in the equivalent of 355 L/ha. The agricultural molasses plus AGRI-KELP was applied at 3 L/ha and 353 ml/ha, respectively; BOTRAN 75 W was applied at 3.4 kg/ha and the ZINEB 80 W was applied at 2.25 kg/ha on July 24, August 2 and August 13. On August 20, samples of 25 onions per rep were rated for percentage of green leaf tissue and number of dead leaves per plant. Onions from a 2.33 m length of row were harvested on September 16 and weighed to determine yield.

RESULTS: As presented in the table below.

CONCLUSIONS: There were no significant differences among the fungicides used to control botrytis leaf blight. When comparing the percentage of green leaves and leaf-dieback, the untreated check was significantly worse than the fungicides, with more leaf-dieback and lower percent green leaves. The 3 fungicides did control the botrytis leaf blight but at the end of the growing season there were no significant differences in yield.

Treatment	Percent Green	Number of Dead Leaves/plant	t/ha
AGRI-KELP and molasses	82.5 a *	1.7 a	33.6 a
BOTRAN	80.0 a	2.2 a	40.8 a
ZINEB	79.3 a	2.0 a	31.0 a
Check	55.3 b	3.4 b	40.0 a

* Numbers in a column followed by the same letter are not significantly different at P = 0.05, Protected L.S.D. Test.

DETERMINATION OF THE SPREAD OF ONION WHITE ROT IN STORAGE

Onions, cv. Aries, were grown at the Muck Research Station where there is no white rot present. The onions were harvested in bulk and placed in storage on September 28, 1990. On December 1, 1990, six naturally-infected onions were received by the station and six healthy onions were inoculated with the white rot Sclerotia. A completely randomized design with 3 replicates per treatment was used. There were three treatments (untreated check, naturally infected, inoculated). Each replicate consisted of 15 kg of healthy onions in plastic containers. On December 10, 1990, two naturally-infected onions were placed in the center of each naturally-infected replicate. Two inoculated onions were placed in the center of each inoculated replicate. The untreated check had 2 healthy onions placed in the center of each replicate. The trial was then placed in storage at 1-2^{0}C and 70-75% relative humidity. On January 31, 1991 and March 1, 1991 the treatments were evaluated to see if white rot had developed and spread in storage.

RESULTS: See table below.

CONCLUSIONS: White rot did not spread to any healthy onions in this trial. Not all of the inoculated onions developed white rot. The trial is being repeated.

Treatment	January 31/91 # of Bulbs		March 1/91 # of Bulbs	
	Infected	Healthy	Infected	Healthy
Check	0	105	0	105
Naturally infected	3	113	2	113
Inoculated	.67	106	.67	106

EVALUATION OF LORSBAN 4E FOR ONION MAGGOT CONTROL ON SPANISH ONION TRANSPLANTS

CROP: Spanish Onion cv. Cache

PEST: Onion Maggot, *Delia antiqua* (Meigo)

MATERIALS: LORSBAN 4E (chlorpyrifos)

METHODS: Spanish onions, cv. Cache, were seeded in Plastomer trays in the greenhouse on March 27, 1991. The plants were placed outdoors to harden off on May 6. LORSBAN 4E at 1.6 ml per 475 ml of water per tray was applied to 1/3 of the trays of plants on May 8. The Spanish onions were transplanted into organic soil at Muck Research Station on May 13. A randomized complete block arrangement with 4 blocks per treatment was used. Each replicate consisted of two 5 m rows. LORSBAN 4E at 210 ml in 1000 ml water per 1000 m of row was applied to another 1/3 of the transplants as a field drench on May 28. The effectiveness of the treatments for maggot control was evaluated by counting the number of damaged plants on June 3 and July 16.

RESULTS: As presented in the table below.

CONCLUSIONS: LORSBAN 4E applied to plug plants prior to transplanting significantly reduced the incidence of onion maggot damage to Spanish onions at mid-summer (July 16). Applications of LORSBAN 4E to plug plants or in the field reduced the incidence of damage from both the first (June 3) and second (July 16) generation of maggots but these differences were not significant. Applications of LORSBAN 4E to the plug plants in the trays provides effective onion maggot control with a very small amount of insecticide.

Method	Treatment	Rate ml/L	June 3 Percent Damage	July 16 Percent Damage
Tray Drench	LORSBAN 4E	3.4	0.0 a *	0.50 a
Field Drench	LORSBAN 4E	210.0	2.25 a	2.25 ab
Check			7.00 a	9.50 b

* Numbers in a column followed by the same letter are not significantly different at P = 0.05, Protected L.S.D. Test.

SPANISH ONION MANAGEMENT TRIAL - 1991

The Spanish onion cultivar, Cache, was seeded in Plastomer trays in the greenhouse on March 27, 1991. The plants were placed outdoors to harden off on May 6. Eight treatments of Spanish onions were transplanted into organic soil at the Muck Research Station May 13 and one treatment that was direct seeded. A randomized complete block arrangement with 4 blocks per treatment was used. Each replicate consisted of two 5 m rows. Evaluation for the effectiveness of the treatments for percent marketable yield was completed 6 weeks after harvest. The trial was harvested on September 17.

RESULTS: As presented in the table below.

CONCLUSIONS: There was a significant difference in the percent of marketable onions at harvest when seeding more than one seed per plug. The treatments with two or three seeds per plug had a greater total production but there was a decrease in percent marketable. Clipping the onion tops to 5.5 inches before transplanting did not have a significant effect on percent of marketable onions.

Treatment	Percent Marketable> 3.5"	Harvested Yield t/ha	Harvested Yield b/a	Marketable Yield t/ha	Marketable Yield b/a
Clipped	90.1 a*	96.7 a	1721	87.2 ab	1552
One seed/plug	88.8 a	94.5 a	1682	83.9 ab	1493
Field Drench	88.4 a	90.1 a	1604	79.6 b	1417
Tray Drench	84.3 ab	92.1 a	1639	77.7 b	1383
Unclipped	84.3 ab	90.9 a	1618	76.6 b	1363
No Insecticide	83.4 ab	40.6 b	723	33.9 c	603
Two seed/plug	66.9 bc	103.4 a	1841	69.2 ab	1232
Three seed/plug	56.3 c	117.5 a	2092	66.2 a	1178
Direct seed	17.7 d	41.4 b	737	7.3 c	130

Listed in Order of % Marketable

* **Numbers in a column followed by the same letter are not significantly different at P = 0.05, Protected L.S.D. Test.**

EFFECT OF LINURON RESIDUES IN ORGANIC SOILS ON EMERGENCE AND GROWTH OF ONION SEEDLINGS - 1991

Onions, cv. Eskimo, were seeded in 6 L pots of organic soil obtained from either the Muck Research Station (.180 ug/g residue) or from a field where carrots have been grown for 1 year (linuron residue .210 ug/g) or 3 years (linuron residue .100 ug/g) or 5 years (linuron residue .095 ug/g). There were 20 seeds/pot and 5 pots per soil source. The pots were seeded on January 4, 1991 and kept in the greenhouse for the duration of the trials. Emergence was recorded when the onions were in the loop stage. Onions were harvested at the 3 true leaf stage. The roots were clipped off and the weight of the onion (bulb and shoot) was recorded as well as the length of the shoot, from the neck to the top of the longest leaf.

The linuron residues had no effect on the 5 year soil at the 3 leaf stage on average weight and average length, .620 kg and 25.c cm respectively. There was a significant difference between the five year sample and the other three samples at the 3 leaf stage. However at maturity date, the soil sample from the Muck Research Station was significantly different from the 5 year, 3 year and 1 year soil samples. Within this trial, we had a significant problem with onion smut, however there does not seem to be any significant reduction in yield amongst the soil samples at harvest.

			February 27		April 11		
Treatment	Germ. Count%	Ave. * Linuron ug/g	Average Weight kg	Average Length cm	Average Weight kg	Average Length cm	Ave. Bulb Thickness
Linuron 5 Yr	61.0	.095	.620 a**	25.3 a	3.54 a	29.62 a	1.410 a
Linuron 3 Yr	52.5	.100	.294 b	16.6 b	3.25 a	28.43 a	1.215 a
Linuron 1 Yr	48	.305	.210 b	14.5 b	4.48 a	29.56 a	1.703 a
No-Linuron	53	.180	.213 b	15.0 b	.94 b	19.24 b	.430 b

* Information obtained from pesticide residue lab in Guelph

** Numbers in a column followed by the same letter are not significantly different at P = 0.05, Protected L.S.D. Test.

EFFECT OF OIL-SEED RADISH AND SORGHUM-SUDAN GRASS ON SALT CONCENTRATIONS IN MUCK SOIL

Soil samples were taken on June 4, 1990 from organic soil at the Muck Research Station where high salt concentrations had been noted in previous years. Sorghum-sudan grass and oil-seed radish were broadcast-seeded on June 7 at rates of 45 kg/ha and 11.3 kg/ha, respectively. The plots were arranged in a completely randomized design. The cover crops were cut back twice during the growing season to a height of 30 cm. On October 1, the cover crops were sprayed with Gramoxone (paraquat) at the recommended rate of 2.5 L/ha. Soil samples were again taken from all plots on October 25. Results showed a significant drop in the salt concentration from a range of 1.3-3.2 millisiemens/cm which is extremely toxic to vegetable seedlings, to a range of 0.31-0.96 millisiemens/cm. Values of under 0.46 are suitable for most plants, whereas values over 1.0 can be expected to result in severe damage. There was no significant difference between the two cover crops in the reduction of salt concentration that occurred.

Soil samples were taken on June 10, 1991. The salt levels had increased from the previous fall. The salt levels increased by .13 to .65 millisiemens/cm, but were not as high as the June , 1990 levels. It is not evident if the drop in salt concentration is solely because of the cover crops or if other factors such as the regular rainfallin 1990 and improved drainage also influenced the results. However, salt levels do increase after winter melt. It may be necessary to continue the Sorghum-Sudan grass and oil-seed radish treatments to help flush the salts out of the soil and keep the salt levels from building up.

It was observed that Sorghum-Sudan grass was more sensitive to high salt concentrations in the soil than was oil-seed radish.

	Salt Concentration		
Treatment	June 4/90	October 25/90	June 10/91
Sorghum-Sudan	1.94 a	.58 b	-
Sorghum-Sudan	-	.58 a	.85 a
Oil-seed Radish	2.33 a	.63 b	-
Oil-seed Radish	-	.63 b	.91 a

* Numbers in a row followed by the same letter are not signifgicantly different at P = 0.05, Protected L.S.D. Test.

INSECTICIDE EFFICACY FOR THE CONTROL OF GREEN PEACH APHIDS - 1991

The ethnic vegetables were seeded on July 3 and July 17, 1991 at the Muck Research Station. A randomized complete block arrangement with 4 reps per treatment consisting of 2 (Guy Lon) and 3 (Bok Choi) x 5 meter rows. Aphid counts were taken on August 15, 20 and 26. Insecticides, Cycon 480 EC, Rotenone WP, and Cymbush 250 EC were applied on August 16 and 22 using a single bed (1.7 m wide) field sprayer (Enti) with solid cone nozzles applying 353 L of water per hectare at 65 p.s.i.

Due to heavy rains after the first application on August 16, the trial was repeated on August 22. All of the insecticides applied were significantly better than the check.

Table 1. Bok Choi

Treatment	Rate of Product/ha	# of Aphids/Leaf Aug 15	Aug 20	Aug 26	Percent Protection *
Cymbush 250 EC	140 ml	23.6	14.7	8.7	63.1 a **
Rotenone WP	4.5 kg	11.5	7.7	4.4	61.7 a
Cycon 480 EC	1.0 L	12.3	11.8	6.7	45.5 ab
Check	-	9.9	9.2	8.5	14.1 b

* Total protection from August 15 thru August 26

** Numbers in a column followed by the same letter are not significantly different at P = 0.05, Protected L.S.D. Test.

Table 2. Guy Lon

Treatment	Rate of Product/ha	# of Aphids/Leaf Aug 15	Aug 20	Aug 26	Percent Protection *
Cymbush 250 EC	140 ml	4.8	8.4	0.3	93.7 a **
Rotenone WP	4.5 kg	3.4	8.6	1.2	74.7 a
Cycon 480 EC	1.0 L	5.3	8.4	1.9	64.2 a
Check	-	8.4	8.0	6.6	21.4 b

* Total protection from August 15 through August 26

** Numbers in a column followed by the same letter are not significantly different at P = 0.05, Protected L.S.D. Test.

POTENTIAL OF MARIGOLDS TO SUPPRESS NEMATODE POPULATIONS IN ORGANIC SOILS

A trial was established to evaluate the potential of marigolds to suppress nematodes in organic soil as compared to onions (a poor host) and carrots (a good host). Plots were established in 2 field sites, (Sites 1 and 2) of naturally infested organic soil and in microplots (1 x 2 m) at the Muck Research Station (Site 3). Microplots were artificially infested with root knot nematodes. The 2 field sites were seeded on June 12, 1991; the microplots were seeded on June 20, 1991. There were 4 replicates per treatment arranged in a randomized complete block design. Each rep on the field sites was 4.25 m x 4.3 m.

Soil samples were taken in each rep prior to seeding and were analyzed for numbers of plant parasitic nematodes (pin, stunt and root-knot) by Agriculture Canada, Vineland. The crops were harvested on Sept. 11, Sept. 11 and Oct. 2 for Site 1, 2 and the microplots, respectively. Plants were rated for nematode damage and soil samples were taken for another analysis of nematode populations.

Nematode populations were low at all sites in the spring (0-70 root-knot nematodes/kg, 0-220 pin nematodes/kg and 0-35 spiral nematodes/kg). At harvest, nematode populations decreased in all trials where marigolds were grown and in most cases increased where carrots were grown. However, in Site 2, populations of spiral and root-knot nematodes declined to 0 for all treatments while populations of pin nematodes increased slightly under onions (70/kg to 110/kg) and increased dramatically under carrots (220/kg to 47,635/kg). The population of pin nematode under marigolds decreased from 100/kg to 20/kg over the growing season. The percentage of carrots with symptoms of nematode injury was 6.6, 0.3 and 4.9 % where root-knot nematode counts were 110, 0 and 15 per kg of soil at harvest. Marigolds as a summer cover crop show potential for suppressing populations of root-knot, spiral and especially pin nematodes.

EFFECT OF SOIL SOLARIZATION ON PYTHIUM POPULATIONS IN ORGANIC SOIL

PEST: Pythium spp.

MATERIALS: 6 ml clear plastic 20'x 100'

METHODS: The trial was conducted in naturally infested organic soil at the Muck Research Station. Five treatment plots were prepared, approximate size 18 m x 13.7 m, for each solarization period of 0,2,4,6 or 8 weeks. The plots were covered with 6 ml clear plastic on July 18, 1991. When the solarization period was completed, the plastic was removed and soil samples were taken. The soil samples were collected at a depth of 0-10 cm with a 7.5 cm x 2 cm soil probe, 40 cores were taken from each plot along a diagonal transect. Samples were also taken prior to coverage. The soil cores were mixed together and 3-10 g sub-samples were taken from each bulk soil sample. Each sub-sample was air dried, weighed again, and placed in 100 ml of water. The soil solutions were shaken at 60 rpm for 1 hour. From the 1 in 10 solutions, 1 ml aliquots were taken and added to 10 ml of water. 100 ml samples from each dilution were placed on plates of Pythium selective culture media, 10 plates for each treatment and each dilution (10^{-2} and 10^{-3}). Plates were inoculated on September 30 and placed in a darkened container at room temperature. The plates were checked each day and Pythium colonies (colony forming units, cfu's) were counted until the colonies overgrew the plates usually within 3-5 days. The number of cfu/g of soil was calculated using the air-dried weights of the soil sub-samples.

RESULTS: As presented in the table below.

CONCLUSIONS: Colony forming units per g of soil were less in the 10^{-2} dilution than in the 10^{-3} dilution. This anomaly may reflect competition between colonies on a plate or rapid overgrowth of slow-growing colonies by faster-growing colonies. The longer the solarization period the better the control of Pythium spp. A solarization period as short as 2 to 4 weeks significantly reduced Pythium populations in the top 10 cm of organic soil.

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EFFECT OF SOIL SOLARIZATION ON PYTHIUM POPULATIONS IN ORGANIC SOIL - continued

Effect of Soil Solarization on Pythium Populations in Organic Soil

Soil Source	Solarization weeks	Dilution 10^{-2} Mean Cfu/plate**	Dilution 10^{-2} Mean Cfu/g soil	Dilution 10^{-3} Mean Cfu/plate	Dilution 10^{-3} Mean Cfu/g soil
M.R.S.	0	20.1 a *	2,486 a	5.1 a	6,300 a
M.R.S.	2	9.1 b	1,358 b	3.8 b	5,560 a
M.R.S.	4	8.3 bc	1,122 bc	1.6 c	2,200 b
M.R.S.	6	5.0 cd	804 cd	1.1 d	580 bc
M.R.S.	8	3.8 d	562 d	0 d	0 c

* Numbers in a column followed by the same letter are not significantly different at P = 0.05, Protected L.S.D. Test.

** cfu = colony forming units of Pythium spp.

EFFECTS OF NEW LINURON FORMULATIONS ON TOLERANCE AND YIELD - 1991

Two new formulations of Linuron, 400L and 480L were tested. The two formulations were applied at full rate and half rate plus one untreated check. The treatments were replicated 3 times in a randomized complete block arrangement. The trial was seeded May 27, 1991. Each rep was 5 m in length with 3 rows 55 cm apart. The carrot, cv. Caropak, was sown with a precision seeder to a depth of 1.25 cm, 80 seeds per meter, in a 9 cm band. An application of Gesagard 2.75 kg/ha and Gramoxone 2.25 L/ha were applied to all the treatments. On July 13, the four treatments of Linuron were applied to the carrots. Phytotoxicity was observed 10 days after application, on July 23. Damage to the leaves was rated on a scale of 1-5, where 1 was severe damage and 5 was no damage. The two formulations 400 EC and 480 EC at the full rate showed the most damage to the carrot foliage. However, all the treatments had significantly more phytotoxicity than the untreated check.

Visual ratings were taken throughout the growing season until harvest date October 9. At harvest, there were no statistical differences in tons/hectare and percent marketable.

Treatment	Rate L/ha	Tolerance Rating	t/ha	Percent Marketable
400 EC	2.70	4.0 b *	74.6 a	81.2 a
480 EC	2.25	3.7 c	77.0 a	79.1 a
400 EC	5.40	3.2 d	74.5 a	82.1 a
480 EC	4.50	3.1 d	75.2 a	79.9 a
Check	-	5.0 a	94.3 a	83.0 a

* Numbers in a column followed by the same letter are not significantly differenct at P = 0.05, Protected L.S.D. Test.

Rating Scale = 5.0 = No Damage
3.7 = Average
1.0 = Severe Damage

BEET CULTIVAR TRIALS - 1991

MANAGEMENT PROCEDURES

Fertilizer: 265 kg/ha ammonium nitrate (33%) + 20 kg/ha Borax was worked into the soil.

Seeded: May 30 using a V-belt seeder equipped with a 5 cm wide scatter shoe. The seeding rate was 15 seeds/m. Rows were 55 cm apart. The trial was replicated three times.

Insect & Disease Control: According to IPM recommendations.

Minor Elements: 2 foliar sprays of 2.25 L/ha Foli-Gro.

Harvest: The trial was harvested on July 29.

EVALUATION

The cultivars were evaluated on July 30.

Marketable Yield t/ha + b/a: Packaging purposes size was 16 to 32 mm in diameter.
Processing purposes size was 32 mm and greater in diameter.

Score: The average of six marks from uniformity of shape to zoning.

Length of Tops: S = small, M = medium, L = long

RED BEET CULTIVAR TRIAL - PROCESSING TYPES 32 MM - 1991

Cultivar	Source	Days to Harvest	Marketable Yield t/ha	Marketable Yield b/a	% Marketable		Stand/Meter	Uniformity Shape	Uniformity Size	Length of Tops	Ext. Smoothness	Root Colour Exterior	Root Colour Interior	Root Colour Zoning		Score
Big Red	A.Ch.	60	43.9	702	98.4	a*	23	3.4	3.4	S	3.7	3.8	3.3	2.3	d	3.32
CX 5033	A.Ch.	60	41.1	706	97.8	a	41	3.8	3.2	M	3.7	3.6	3.6	3.1	abcd	3.50
Cyndor	A.Ch.	60	33.5	536	86.1	a	24	3.3	3.0	S	4.3	4.0	3.9	2.8	cd	3.55
Detroit Supreme	A.Ch.	60	44.9	718	96.1	a	30	3.2	3.4	M	3.8	3.7	3.7	2.9	cd	3.45
Pace Maker III	A.Ch.	60	57.4	918	98.3	a	25	3.8	3.8	L	3.7	3.8	3.8	3.9	a	3.80
Red Ace	A.Ch	60	48.0	768	97.8	a	29	3.5	3.7	L	3.7	3.7	3.8	3.8	ab	3.70
Warior	HM	60	45.7	731	94.0	a	31	3.9	3.4	M	3.7	3.7	3.4	2.7	cd	3.47
Bolivar	NUN	60	33.0	528	92.7	a	38	3.1	3.0	M	3.5	3.7	3.8	4.0	a	3.52
Ivax	NUN	60	37.1	594	90.3	a	17	2.8	3.1	ML	3.7	3.7	3.7	3.2	abcd	3.37
Action F1	Swy	60	57.7	923	99.3	a	25	3.7	3.8	ML	3.5	3.8	3.5	3.1	abcd	3.57
Pablo F1	Swy	60	45.0	720	96.4	a	24	3.5	3.6	ML	3.5	3.6	3.8	4.0	a	3.67
Wodan F1	Swy	60	60.8	973	98.9	a	29	3.0	3.2	ML	3.9	3.5	3.6	3.5	abc	3.45
Big Red	Sto	60	41.8	669	93.9	a	38	3.4	3.0	S	3.7	3.8	3.4	2.9	de	3.37
Pacemaker III	Sto	60	48.8	781	94.2	a	26	3.7	3.5	L	3.7	3.7	3.4	2.9	bcd	3.48
Red Ace	Sto	60	53.1	850	98.0	a	25	3.9	3.5	L	3.8	3.8	3.3	2.9	bcd	3.53
Kogel RZ	ZW	60	49.9	798	99.4	a	29	3.0	2.8	L	3.8	3.7	3.3	3.2	abcd	3.30
Libero RZ	ZW	60	55.9	894	92.1	a	29	3.0	3.2	L	4.0	3.8	3.8	4.0	a	3.63

Listed in Alphabetical order according to seed source.

* Numbers in a column followed by the same letter are not significantly different at P = 0.05, Protected L.S.D. Test.

5 = Most Desirable, 4 = Good, 3.7 = Average

RED BEET CULTIVAR TRIAL - PACKAGING TYPES 32 mm - 76 mm - 1991

Cultivar	Source	Days to Harvest	Marketable Yield t/ha	Marketable Yield b/a	% Marketable		Stand/Meter	Uniformity Shape	Uniformity Size	Length of Tops	Ext. Smoothness	Root Colour Exterior	Root Colour Interior	Root Colour Zoning		Score
Big Red	A.Ch.	60	16.3	261	21.9	defg*	23	3.4	3.4	S	3.7	3.8	3.3	2.3	d	3.32
CX 5033	A.Ch.	60	25.7	411	59.6	bc	41	3.8	3.2	M	3.7	3.6	3.6	3.1	abcd	3.50
Cyndor	A.Ch.	60	33.5	536	86.1	a	24	3.3	3.0	S	4.3	4.0	3.9	2.8	cd	3.55
Detroit Supreme	A.Ch.	60	28.3	453	60.6	bc	30	3.2	3.4	M	3.8	3.7	3.7	2.9	cd	3.45
Pace Maker III	A.Ch.	60	22.9	366	39.2	def	25	3.8	3.8	L	3.7	3.8	3.8	3.9	a	3.80
Red Ace	A.Ch	60	22.2	355	44.7	cde	29	3.5	3.7	L	3.7	3.7	3.8	3.8	ab	3.70
Warior	HM	60	19.2	307	39.5	def	31	3.9	3.4	M	3.7	3.7	3.4	2.7	cd	3.47
Bolivar	NUN	60	29.7	475	83.4	a	38	3.1	3.0	M	3.5	3.7	3.8	4.0	a	3.52
Ivax	NUN	60	10.0	160	24.3	abcd	17	2.8	3.1	ML	3.7	3.7	3.7	3.2	abcd	3.37
Action F1	Swy	60	18.1	290	31.2	abcd	25	3.7	3.8	ML	3.5	3.8	3.5	3.1	abcd	3.57
Pablo F1	Swy	60	17.0	272	36.4	a	24	3.5	3.6	ML	3.5	3.6	3.8	4.0	a	3.67
Wodan F1	Swy	60	25.4	406	41.3	abc	29	3.0	3.2	ML	3.9	3.5	3.6	3.5	abc	3.45
Big Red	Sto	60	29.8	477	67.0	b	38	3.4	3.0	S	3.7	3.8	3.4	2.9	de	3.37
Pacemaker III	Sto	60	22.2	355	42.9	def	26	3.7	3.5	L	3.7	3.7	3.4	2.9	bcd	3.48
Red Ace	Sto	60	15.5	248	28.6	fg	25	3.9	3.5	L	3.8	3.8	3.3	2.9	bcd	3.53
Kogel RZ	ZW	60	25.5	408	50.8	cd	29	3.0	2.8	L	3.8	3.7	3.3	3.2	abcd	3.30
Libero RZ	ZW	60	21.1	338	34.8	efg	29	3.0	3.2	L	4.0	3.8	3.8	4.0	a	3.63

Listed in Alphabetical order according to seed source.

* Numbers in a column followed by the same letter are not significantly different at P = 0.05, Protected L.S.D. Test.

5 = Most Desirable, 4 = Good, 3.7 = Average

CARROT CULTIVAR TRIALS - 1991 - PACKAGING TYPES

MANAGEMENT PROCEDURES

Fertilizer: 108 kg/ha of ammonium nitrate (33%) + 96 kg/ha of potash (55%) + 15 kg of Borax (14%) was worked into the soil.

Seeded: May 27 and 28 using a V-belt seeder equipped with a 10 cm wide scatter shoe. The Main Trial was seeded on beds 86 cm apart. The seeding rate was according to germination. The Adaptation and Observation Trials were seeded using a V-belt seeder equipped with a 5 cm wide scatter shoe. The rows were 50.5 cm apart with seeding rate according to germination.

Weed Control: Pre-emergence: 1 application of 2.75 kg/ha Gesagard.
Post-emergence: 2 applications of 1.7 kg/ha of Maloran.

Insect and Disease Control: According to IPM recommendations

Minor: 1 foliar spray of 2.0 kg/ha of Epsom salts.

Harvest: The Main Trial was harvested October 8. All trials were immediately placed in a temperature and humidity controlled storage (0°C) after harvest.

EVALUATION

The cultivars were evaluated on November 27 after 7 weeks in storage.

Marketable Yield t/ha + b/a: The marketable yield includes the packaging size, 19 to 44 mm (3/4" to 1 3/4") as well as the oversize > 44 mm (1 3/4" +).

Score: The average of the seven marks from shape to core size.

% Cavity Spot and Degree: The number indicates the percentage of roots with cavity spots. The letters indicate the degree to which the roots were affected. VL = Very Light - cavity spots are few and barely visible. L = Light - few, small spots. M = Medium - roots borderline unmarketable. H = Heavy - large cavity spots, roots unmarketable. VH = Very Heavy - many large cavity spots, roots unmarketable e.g. 50H - 50% of the roots were heavily infected with cavity spots, roots unmarketable.

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CARROT CULTIVAR TRIALS - 1991 - PACKAGING TYPES - continued

MANAGEMENT PROCEDURES

EVALUATION - continued

Rusty Root: Rusty root was evaluated at harvest. 5 = Most Desirable, no rusty roots. 4 = Very few roots affected, no effect on root development. 3 = Many rust coloured roots hairs, and some rat tailing. 2 = Many rust coloured root hairs, definite rat tailing, root flesh reduced. 1 = Least Desirable, no flesh to the root, only a rat tail with a mass of root hairs.

Blight: Regular fungicide applications were discontinued on September 8 to allow the cultivars to be evaluated for tolerance to leaf blights. Evaluation took place October 8. 5 = most desirable, no blight. 4 = mild blight on leaves, nothing on petioles. 3 = blight on leaves, a few lesions on petioles. 2 = severe blight on leaves, numerous lesions on petioles. 1 = tops completely rotted, crop can not be harvested.

CARROT CULTIVAR MAIN TRIAL - 1991 - PACKAGING TYPES

Cultivar	Source	Marketable Yield t/ha	Marketable Yield b/a	% Oversize	% Marketable	Root Length (cm)	Root Width (cm)	Uniformity Shape	Uniformity Size	Appearance	Resistance to Greening	Colour Internal	Colour External	Core Size	Score	% Cavity Spot & Degree	Blight
Sunre 3231	Sun	43	694	50	67	26	4.8	3.9	3.4	2.9	4.9	3.7	3.7	2.7	3.59	40M	4.9
Sunre 3229	Sun	30	483	43	50	26	4.5	3.0	3.8	2.2	4.3	3.7	3.7	2.7	3.33	40H	4.7
XPH 3507	Asg	53	845	12	71	26	3.7	4.0	3.9	3.7	4.4	3.3	3.4	3.7	3.78	67M	4.8
Pak Mor	HM	69	1108	20	74	25	3.6	3.9	3.4	3.6	4.3	3.1	3.6	3.1	3.58	53M	5.0
Canada Sup. X	PES	62	993	19	73	25	3.6	4.0	3.2	3.4	4.4	3.6	3.6	3.7	3.69	57M	4.9
SR 790	Sun	35	562	24	60	25	3.6	3.4	3.1	2.8	4.8	3.3	3.4	3.2	3.44	70M	4.8
Sunrise	Cro	85	1372	9	86	24	3.5	4.2	4.1	3.7	4.5	3.6	3.4	3.8	3.89	40M	4.9
Exp 436	PES	78	1248	12	83	24	3.6	4.1	3.9	3.3	4.5	3.4	3.4	3.9	3.80	63H	4.9
Cello King	NK	68	1096	23	75	23	3.4	3.7	3.4	3.0	4.8	3.6	3.0	3.6	3.58	63M	4.9
Hyb. Ice Gold	W.H.P.	62	995	18	72	23	3.7	4.0	3.8	3.0	4.2	3.8	3.6	3.2	3.66	50L	4.9
Six Pak	HM	48	774	14	66	23	3.5	4.1	3.6	3.6	4.6	3.6	3.6	3.7	3.80	47H	4.9
Six Pak II	HM	75	1208	14	78	23	3.6	4.0	3.7	3.6	4.6	3.2	3.4	3.5	3.73	50L	4.9
Top-Pak	HM	63	1011	14	75	22	4.1	3.7	3.3	3.4	4.3	3.2	3.4	3.2	3.51	63M	5.0
Dawn	Cro	70	1127	5	69	22	3.7	4.0	3.8	3.8	5.0	3.7	3.6	3.6	3.91	57M	4.8
Navajo	Sun	40	642	38	54	22	4.2	3.5	3.2	3.0	4.8	3.2	3.7	3.1	3.51	43M	4.8
Apache	Sun	63	1013	40	81	22	4.0	4.1	3.3	3.5	4.8	3.7	3.7	2.8	3.70	60M	4.9
Lucky B Carrot	Gab	35	557	47	69	21	4.5	4.4	4.2	4.0	2.8	3.5	3.4	2.9	3.60	50H	5.0
Blaze	NK	56	897	24	77	20	3.7	4.0	3.6	3.5	4.8	3.7	3.7	3.8	3.86	53M	4.7

Listed in Order of Length

5 = Most Desirable, 4 = Good, 3.7 = Average

Root Length (cm): 20 cm = 8 inches

CARROT CULTIVAR ADAPTATION TRIAL - 1991 - PACKAGING TYPES

Cultivar	Source	Marketable Yield t/ha	Marketable Yield b/a	% Oversize	% Marketable	Root Length (cm)	Root Width (cm)	Uniformity Shape	Uniformity Size	Appearance	Resistance to Greening	Colour Internal	Colour External	Core Size	Score	% Cavity Spot & Degree	Blight
Orangette	Sto	78	1248	14	69	23	3.7	3.7	3.0	3.3	4.7	3.3	3.3	4.0	3.61	60M	5.0
HMX 9289	HM	29	472	5	28	23	3.6	3.7	3.7	2.7	4.3	3.7	3.3	3.7	3.59	40L	5.0
HMX 9290	HM	27	433	0	31	23	3.7	3.3	3.7	3.3	4.7	3.7	3.3	3.7	3.67	60M	5.0
FMX 331	FM	64	1032	11	65	23	3.6	3.7	3.7	3.3	4.7	3.3	3.3	3.3	3.61	40L	5.0
781	A&C	54	869	22	67	22	3.7	3.3	3.7	2.7	4.7	3.3	3.3	3.3	3.47	30L	5.0
FMX 295	FM	31	494	28	75	22	3.5	4.3	4.0	4.0	4.7	2.7	3.3	3.7	3.81	40M	5.0
FMX 351	FM	39	620	20	54	22	3.6	3.3	3.7	3.7	4.7	3.3	3.3	3.7	3.67	50L	4.7
FMX 350	FM	25	394	8	40	22	3.8	4.0	4.0	3.3	4.7	3.3	3.3	3.3	3.70	20VL	5.0
HMX 5280	HM	40	639	15	44	22	3.9	3.3	3.7	3.3	4.7	2.7	3.7	3.3	3.53	30M	4.7
711	A&C	51	823	36	66	21	3.8	3.0	3.0	3.3	4.3	3.7	3.3	3.7	3.47	40L	5.0
HMX 5281	HM	83	1328	19	69	21	3.7	3.3	3.3	3.0	4.7	3.7	3.3	3.3	3.51	30L	5.0
HMX 8288	HM	6	103	21	45	21	3.9	3.7	3.7	2.7	4.3	3.3	3.3	4.0	3.57	30M	5.0
Discovery	Sto	52	839	9	61	21	3.6	3.7	3.7	3.3	4.7	3.0	3.3	3.7	3.63	50M	5.0
Avenger	Sto	51	818	11	48	21	3.5	3.3	3.0	3.0	4.7	3.7	3.7	3.3	3.53	50M	5.0
691	A&C	39	623	32	55	20	3.5	3.3	3.3	3.0	4.7	3.0	3.7	3.7	3.53	50M	5.0
Flame	NK	34	554	7	44	20	3.4	3.7	3.7	3.3	5.0	3.7	3.3	3.7	3.77	50M	5.0
Spartan Premium 80	Sto	39	626	5	49	20	3.8	3.3	4.0	3.7	4.3	4.0	3.3	3.7	3.76	70M	5.0
Eagle	Sto	78	1249	24	72	20	3.6	4.7	4.0	3.3	4.3	3.3	3.3	3.7	3.80	20VL	5.0
Hy. Carrot Ingot	A.Ch.	43	697	38	70	19	3.6	3.3	3.0	3.0	4.7	3.7	3.0	3.7	3.49	40L	5.0
Bolero	Vil	90	1443	15	86	19	3.9	4.7	4.0	3.7	3.7	3.0	3.7	3.3	3.73	20M	4.7
Nanco	Sto	94	1510	12	85	19	3.9	4.7	4.3	3.3	3.7	3.7	3.0	3.7	3.77	50L	5.0
Legend	Sto	26	414	9	22	18	3.5	3.7	3.3	3.0	4.7	4.0	3.7	3.3	3.67	40L	4.7

Listed in Order of Length

5 = Most Desirable, 4 = Good, 3.7 = Average

Root Length (cm): 20 cm = 8 inches

CARROT CULTIVAR STORAGE TRIAL 1990-91 - PACKAGING TYPES

Cultivar	Source	% Marketable	% Weight Loss	% Decay	Degree of Decay**
Prospector	PETO	83.7 a*	8.7	6.7 f	2.7
24 Karat	FM	80.9 a	9.5	8.8 ef	3.5
Dawn	Cro	78.3 ab	10.3	10.9 def	2.9
XPH 3708	Asg	76.9 ab	8.2	14.1 bcdef	3.1
Sunrise	Cro	76.5 ab	11.4	11.4 def	3.0
Fanci Pak	NK	76.3 ab	10.3	12.7 def	3.3
Six Pak	HM	76.2 ab	12.2	12.2 def	3.9
Apache	Sun	74.8 abc	10.4	14.3 cdef	3.0
XPH 3507	Asg	74.0 abc	8.5	17.1 abcdef	2.0
Six Pak II	HM	72.2 abc	8.6	18.4 abcdef	2.7
Day Break	Cro	71.6 abcd	11.9	15.9 bcdef	3.6
Six Pence	HM	70.8 abcd	9.0	19.4 abcde	2.7
Canada Super X	PES	67.2 bcde	11.3	21.0 abcd	2.8
Sierra	NK	67.0 bcde	8.8	24.5 abc	2.9
Navajo	Sun	62.8 cde	10.3	26.0 ab	3.0
Flame	NK	58.0 de	14.0	27.2 ab	2.6
Western Red	FAIR	57.2 e	13.5	28.9 a	2.2
Average:		72.0	10.4	17.0	2.9

Listed in Order of % Marketable

* Numbers in a column followed by the same letter are not significantly different P = 0.05, Protected L.S.D. Test.

** 5.0 = No Disease, 3.7 = Moderate, 1.0 = Severe (liquidified)

Harvested October 21, 1990 and placed in cold storage. The storage temperature was maintained at 0°C to 2°C and the relative humidity was maintained at 85-95%.

Samples were judged on March 8 and 11, 1990. Total Storage Period: 20 weeks

LONG TERM AVERAGES - CARROT CULTIVAR STORAGE TRIAL - PACKAGING TYPES

Cultivar	Source	# Years Tested	% Marketable	% Weight Loss in Storage	% Decay	Degree* of Decay
Spartan Classic 80	Sto	4	90.8	6.8	2.4	3.5
King Imperator	Sto	3	88.0	7.3	4.7	3.7
Gold Pak 28	Sto	3	86.7	10.0	3.3	4.2
Hi Pak	HM	4	86.2	9.3	4.5	4.1
Spartan Sweet "A"	Cro	4	86.1	7.6	6.3	3.5
Spartan North "A"	Cro	5	85.8	9.4	4.8	3.6
Canuck	Sto	7	85.6	8.1	6.3	4.3
Klondike Nantes	Sto	4	85.6	8.1	6.3	3.7
Lance	Sto	4	84.8	8.5	6.7	2.9
Grenadier	HM	5	84.6	8.8	6.6	3.6
Candy Pak	Cro	8	84.6	11.3	4.1	2.9
Spartan Fancy 80	Asg	4	84.5	10.3	5.2	3.4
Cutlass	Sun	4	84.3	9.3	6.4	3.5
24 Karat	FM	3	84.0	7.2	8.6	3.3
GoldPak 263	Asg	4	83.9	9.0	7.1	3.7
A-Plus	Asg	3	83.9	11.8	4.3	3.2
Dominator	Sun	4	83.5	9.3	7.2	3.1
Spartan Delite 80	Asg	3	83.3	11.0	5.7	3.5
Orange Sherbet	Sto	6	82.9	9.0	8.1	2.8
Golden State	A.Ch.	2	82.0	8.5	9.0	3.0
Saber 78	Sun	4	81.4	10.8	7.8	3.1
Prospector	PETO	4	80.0	6.3	13.3	2.7
Dagger 78	Sun	6	79.7	11.4	8.9	3.2
Canada Super X	PES	5	78.8	7.4	13.7	2.6
Six Pak	HM	10	78.5	11.6	10.0	3.1
Mokum	BEJO	3	78.5	7.9	13.3	2.5

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LONG TERM AVERAGES - CARROT CULTIVAR STORAGE TRIAL - PACKAGING TYPES - continued

Cultivar	Source	# Years Tested	% Marketable	% Weight Loss in Storage	% Decay	Degree* of Decay
Pak Mor	HM	5	78.0	11.8	10.2	2.9
Golden State	Asg	4	77.9	9.6	12.5	2.6
Cello King	NK	3	77.9	6.6	15.2	2.4
Seminole	Sun	3	77.3	10.0	12.3	2.9
Vitasweet 721	A&C	2	77.0	14.0	9.0	2.7
Centennial	Asg	2	76.5	3.0	20.0	2.8
Discovery	Sieg	2	76.0	6.5	17.0	2.3
Sweet'N Crisp	Cro	3	75.9	15.7	8.4	2.8
Chancellor	Asg	7	75.3	11.3	13.3	2.1
Cellobunch	Asg	4	75.3	12.6	12.1	3.0
Orlando Gold	Sto	6	75.2	12.7	12.1	2.2
Top Pak	HM	4	75.0	12.3	12.7	2.7
Six Pak II	HM	7	74.9	11.0	14.0	2.4
Aristo Pak	Cro	6	73.7	12.5	13.8	2.4
Fanci Pak	NK	3	73.4	10.2	16.2	2.7
Paramount	Asg	3	73.0	13.3	13.7	3.1
Six Pence	HM	4	72.7	8.4	18.4	2.0
Flavour Pak	Cro	3	72.3	15.5	12.2	2.6
Harvestmore	Cro	3	71.0	12.0	17.0	2.6
Sierra	NK	4	70.8	10.2	19.2	2.6
Goldmine	Sun	3	69.6	12.8	17.6	1.8
Diplomat	Asg	4	69.0	15.2	15.8	2.8
Special Nantes 616	Sto	2	68.3	7.4	24.3	2.0
Britepak	A&C	3	68.0	15.0	17.0	2.2
Caropak	Asg	4	67.0	10.7	22.3	2.2
Gold Pride	HM	2	66.7	7.6	25.7	2.4

Listed in Order of % Marketable

Storage Period: 9 months

* 5.0 = No Disease, 3.7 = Moderate, 1.0 = Severe (liquidified)

LONG TERM AVERAGE OF CARROT CULTIVARS - PACKAGING TYPES

Cultivar	Source	# Years Tested	Length cm	Length inches	Marketable Yield t/ha	Marketable Yield b/a	% Mkb.	Score*
Sunrise	Cro	2	23.20	9.13	102.10	1644	86	3.86
Candy Pak	Cro	9	23.06	9.08	67.48	1086	86	4.27
Caro-Pride	Asg	2	23.00	9.06	74.00	1191	67	3.86
FMX 350	FM	2	22.80	8.98	62.50	1006	60	3.64
Scout	PETO	3	22.78	8.97	57.75	930	75	3.83
Orlando Gold	Sto	7	22.63	8.91	69.18	1114	86	4.18
Dagger 78	Sun	8	22.39	8.81	70.62	1137	84	4.21
Spartan Fancy 80	JHK	5	22.12	8.71	70.01	1127	83	4.05
Six Pak	HM	12	22.03	8.67	75.27	1212	83	4.10
Dawn	Cro	2	22.00	8.66	77.50	1248	72	3.94
Caro-Brite	Asg	2	21.95	8.64	77.50	1248	73	3.68
Harvestmore	Cro	6	21.92	8.63	71.44	1150	84	3.89
FMX 295	FM	2	21.90	8.62	55.35	891	68	3.69
Canada Super X	PES	7	21.83	8.59	76.39	1230	80	3.90
Sweet-N-Crisp	Cro	4	21.82	8.59	69.68	1122	86	3.92
Flavour Pak	Cro	4	21.73	8.56	73.43	1182	89	3.97
24 Karat	FM	3	21.73	8.56	90.09	1450	88	3.71
Gold Pride	HM	2	21.72	8.55	80.65	1298	86	4.21
Imperator 58	Cro	9	21.69	8.54	50.34	810	78	3.64
Gold Pak 263	Asg	6	21.58	8.50	60.67	977	85	3.91
FMX 351	FM	3	21.57	8.49	66.07	1064	72	3.64
SDC 1373	CS	2	21.40	8.43	97.50	1570	81	3.76
Navajo	Sun	2	21.40	8.43	61.45	989	71	3.57
HMX 5281	HM	3	21.37	8.41	87.37	1407	72	3.59

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LONG TERM AVERAGE OF CARROT CULTIVARS - PACKAGING TYPES - continued

Cultivar	Source	# Years Tested	Length cm	Length inches	Marketable Yield t/ha	Marketable Yield b/a	% Mkb.	Score*
Caro-Choice	Asg	2	21.25	8.37	93.00	1497	86	3.72
FMX 331	FM	2	21.25	8.37	68.55	1104	61	3.64
HMX 5280	HM	2	21.25	8.37	55.85	899	54	3.31
Orange Sherbet	Sto	10	21.17	8.33	73.36	1181	84	3.81
Golden State	Asg	5	21.09	8.30	76.15	1226	83	4.10
Six Pak II	HM	8	21.01	8.27	78.05	1257	85	3.95
Caropak	Asg	8	20.93	8.24	74.11	1193	85	3.88
Chancellor	Asg	7	20.92	8.24	76.79	1236	83	3.86
Apache	Sun	2	20.85	8.21	67.95	1094	74	3.77
Goldmine	Sun	3	20.82	8.20	71.68	1154	86	3.80
Diplomat	Asg	6	20.80	8.19	71.17	1146	84	3.93
Top Pak	HM	5	20.78	8.18	75.10	1209	85	3.79
Gold Pak 28	FM	12	20.76	8.17	55.91	900	85	3.84
Pak Mor	HM	5	20.74	8.17	62.40	1005	81	3.79
Sierra	NK	6	20.67	8.14	72.11	1161	81	3.91
Plato	A.Ch.	2	20.55	8.09	101.00	1626	82	3.80
Paramount	Asg	7	20.55	8.09	82.14	1322	85	3.89
Spartan Premium 80	Cro	7	20.50	8.07	84.44	1359	82	3.88
Aristo Pak	Cro	6	20.40	8.03	80.21	1291	88	3.88
Dart	Sun	2	20.30	7.99	70.00	1127	78	3.80
Cellobunch	Asg	7	20.24	7.97	87.06	1402	85	3.90
Prospector	PETO	5	20.23	7.96	94.99	1529	83	4.02
Vitasweet 711	A&C	3	20.22	7.96	65.88	1061	75	3.88
Discovery	Sieg	3	20.01	7.88	70.60	1137	78	3.92

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LONG TERM AVERAGE OF CARROT CULTIVARS - PACKAGING TYPES - continued

Cultivar	Source	# Years Tested	Length cm	Length inches	Marketable Yield t/ha	Marketable Yield b/a	% Mkb.	Score*
Seminole	Sun	4	20.01	7.88	69.31	1116	77	3.89
Apollo	A.Ch.	2	19.95	7.85	91.55	1474	84	3.85
Cello King	NK	5	19.89	7.83	78.96	1271	81	4.01
Dominator	Sun	13	19.74	7.77	63.88	1028	85	3.85
Klondike Nantes	Sto	10	19.59	7.71	72.10	1161	85	3.87
Huron	Sun	3	19.58	7.71	84.48	1360	81	3.71
Six Pence	HM	4	19.56	7.70	79.48	1280	80	3.80
Flame	NK	2	19.40	7.64	85.45	1376	78	3.67
Special Nantes 616	Sto	2	19.25	7.58	95.40	1536	84	3.65
Ingot	A.Ch.	3	19.06	7.50	74.10	1193	71	3.88
A Plus	Asg	3	18.71	7.37	70.96	1142	73	4.02
Ingot	Sto	3	18.58	7.31	101.89	1640	83	3.74
Mokum	BEJO	3	18.03	7.10	103.99	1674	80	3.90
Spartan Classic 80	Cro	3	17.93	7.06	63.33	1020	78	3.78
Fontana	Swy	2	16.65	6.56	159.90	2574	91	3.81
Vitasweet 500	A&C	3	15.80	6.22	82.25	1324	82	3.76
Scarlet Nantes	Asg	8	14.50	5.71	66.00	1063	75	3.46
SDC 1371	CS	2	14.30	5.63	108.75	1751	82	3.72
Earlyibird Nantes	Sto	2	14.25	5.61	116.00	1868	89	3.63

Listed in Order of Length

* 5 = Most Desirable, 4 = Good, 3.7 = Average

NOTES

CARROT CULTIVAR TRIALS - 1991 - PROCESSING TYPES

MANAGEMENT PROCEDURES

Fertilizer: 108 kg/ha ammonium nitrate (33%) + 15 kg/ha Borax (14%) was worked in to the soil.

Seeded: On May 29 using a V-belt seeder equipped with a 5 cm wide scatter shoe. The seeding rate was 45 seeds/m. Rows were 50.5 cm apart. The Main Trial was replicated three times. Adaptation and Observation Trials were not replicated.

Weed Control: Pre-emergence: 1 application of 2.75 kg/ha Gesagard.
Post-emergence: 2 applications of 1.7 kg/ha Maloran.

Insect and Disease Control: According to IPM recommendations.

Minor Elements: 1 foliar spray of 2.0 kg/ha of Epsom salts.

Harvest: The Main Trial and Adapation Trial were harvested on October 8. All trials were immediately placed in a temperature and humidity controlled storage (0°C) after harvest.

EVALUATION

The cultivars were evaluated on November 20 after 6 weeks in storage.

Marketable t/ha: Marketable yield of roots over 38 mm (1 1/2") in diameter and also those 19 to 38 mm (3/4" to 1 1/2") in diameter.

Weight/Root (g): The average weight of a root > 38 mm (1 1/2") in diameter.

Crown Shape: Rated on degree of indentation. The more the crown was indented, the lower the mark.

Score: The average of the 10 marks from uniformity to uniformity of colour.

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CARROT CULTIVAR TRIALS - 1991 - PROCESSING TYPES - continued

MANAGEMENT PROCEDURES

EVALUATION - continued

% Cavity Spot & Degree: The number indicates the percentage of roots with cavity spots. The letters indicate the degree to which the roots were affected. VL = Very Light - cavity spots are few and barely visible. L = Light - few, small spots. M = Medium - roots borderline marketable. H = Heavy - large cavity spots, roots unmarketable. VH = Very Heavy - many large cavity spots, roots unmarketable. 50 H - 50% of the roots were heavily infected with cavity spots, roots unmarketable.

Rusty Root: Rusty Root was evaluated at harvest. 5 = Most Desirable, no rusty roots. 4 = Very few roots affected, no effect on root development. 3 = Many rust coloured root hairs, and some rat tailing. 2 = Many rust coloured root hairs, definite rat tailing, root flesh reduced. 1 = Least Desirable, no flesh to the root, only a rat tail with a mass of root hairs.

Blight: Regular fungicide applications were discontinued on September 8, to allow the cultivars to be evaluated for tolerance to leaf blights. Evaluation took place October 8. 5 = Most Desirable, no blight. 4 = Mild blight on leaves, nothing on petioles. 3 = Blight on leaves, a few lesions on petioles. 2 = Severe blight on leaves, numerous lesions on petioles. 1 = Tops completely rotted, crop can not be harvested.

CARROT CULTIVAR MAIN TRIAL - 1991 - PROCESSING TYPES

Cultivar	Source	% Marketable t/ha	Weight/Root > 38 mm (g)	% Marketable	Root							Colour								
					Length (cm)	Width (cm)	Uniformity	Smoothness	Crown Shape	Core Size	Resistance to Greening	External	Cortex	Cambium Zone	Core	Uniformity	Score	% Cavity Spot & Degree	Blight	Slicer
SDC 1371	CS	48	223	85	22	4.5	3.0	3.1	3.3	2.2	3.6	3.0	2.8	3.5	2.6	2.7	3.07	30L	4.8	2.1
EXP 660	PES	73	232	84	19	4.9	3.7	2.9	3.0	2.6	3.4	3.1	3.5	3.3	3.0	3.0	3.21	75H	5.0	3.4
SDC 1374	CS	66	235	74	17	5.1	3.7	3.4	3.1	2.8	3.9	3.1	3.6	3.5	3.0	3.2	3.39	35L	5.0	3.6
Chantenay Supreme	HM	68	280	69	19	5.7	3.2	3.0	3.0	2.9	2.4	3.0	3.1	3.7	2.8	2.9	3.01	50M	4.9	4.0
Orange Delight	PES	17	113	50	17	4.3	2.3	1.9	2.1	1.6	1.9	3.1	2.6	2.8	2.7	2.8	2.47	40M	4.7	2.4

Listed in Order of % Marketable

5 = Most Desirable, 4 = Good, 3.7 = Average

Marketable t/ha: 56 t/ha = 1000 bushels/a

CARROT CULTIVAR ADAPTATION TRIAL - 1991 - PROCESSING TYPES

Cultivar	Source	Marketable t/ha	Weight/Root > 38 mm (g)	% Marketable	Root: Length (cm)	Root: Width (cm)	Root: Uniformity	Root: Smoothness	Root: Crown Shape	Root: Core Size (cm)	Root: Resistance to Greening	Colour: External	Colour: Cortex	Colour: Cambium Zone	Colour: Core	Colour: Uniformity	Score	% Cavity Spot & Degree	Blight	Slicer
Processor IV	Sto	37	204	100	23	4.1	3.7	3.7	3.3	1.4	3.7	3.3	4.0	3.7	3.7	3.7	3.64	10VL	4.7	1.7
Processor II	Sto	100	218	99	17	5.1	4.0	3.7	3.7	2.2	3.7	3.0	3.0	3.0	2.7	3.0	3.31	20VL	5.0	3.7
Nogales	Swy	58	222	95	27	4.3	3.7	3.3	2.3	1.7	4.7	3.3	3.7	3.3	3.3	3.7	3.48	20M	5.0	2.0
Wis. Proc. D	Sto	51	158	93	16	4.4	4.0	3.7	3.0	1.6	4.0	3.3	4.3	4.7	4.0	4.3	3.92	100L	4.7	3.0
FMX-291	FM	100	243	89	18	4.9	3.7	3.3	4.0	2.1	3.7	2.7	3.0	3.0	3.0	2.7	3.23	50M	5.0	3.7
CXC0634	A.Ch.	79	232	89	25	4.3	3.0	2.7	2.3	1.5	3.3	3.0	4.0	3.3	3.3	3.3	3.13	60H	5.0	2.0
CXC6093	A.Ch.	50	201	86	23	4.1	4.0	3.3	2.7	2.3	4.0	3.3	4.3	3.7	3.7	4.0	3.67	20L	5.0	2.0
CX6146	A.Ch.	73	270	86	21	4.8	3.3	3.7	3.7	1.6	4.3	3.3	3.7	2.7	2.7	2.7	3.34	40VL	5.0	3.0
XPH 3738	Asg	95	194	85	16	5.1	4.0	3.7	3.7	2.2	4.3	2.3	3.3	3.7	3.3	4.0	3.59	80H	5.0	3.3
CX6382	A.Ch.	80	296	85	21	5.1	3.0	2.3	4.0	2.9	3.7	3.0	2.7	3.0	2.3	2.3	2.92	60L	5.0	3.3
XPH 3740	Asg	100	249	85	17	4.3	3.0	3.0	3.3	1.8	4.0	3.3	3.7	4.0	3.3	4.0	3.51	60M	5.0	3.7
SDC 1376	CS	65	341	82	22	5.5	3.3	3.7	3.3	2.9	4.0	2.7	3.3	2.7	2.7	3.7	3.27	50H	5.0	3.3
Plato	A.Ch.	29	223	81	24	3.7	3.7	3.7	3.7	2.7	1.3	4.0	3.7	3.7	4.0	3.3	3.46	80M	5.0	1.0
CXC9537	A.Ch.	47	273	80	25	4.0	3.7	3.0	3.0	1.6	3.7	3.7	4.0	3.3	3.3	3.7	3.49	0	5.0	2.0
XPH 87W341	CS	78	288	73	20	5.5	4.0	3.7	3.7	2.2	4.0	3.3	3.3	4.0	3.0	3.3	3.59	30M	5.0	4.0
CX7027	A.Ch.	65	251	72	23	4.7	3.3	3.0	3.0	2.1	4.3	3.3	3.3	3.3	2.7	3.0	3.24	80M	4.7	2.0
XPH 3739	Asg	46	93	71	20	5.2	2.3	3.0	3.7	2.6	3.7	3.3	3.0	2.7	2.3	2.7	2.97	80M	5.0	3.0
CX6097	A.Ch.	35	235	70	23	3.9	3.3	3.0	2.7	1.9	3.0	3.3	3.7	3.0	3.3	3.3	3.18	40L	5.0	1.7
Apollo	A.Ch.	49	260	68	27	4.8	4.0	2.7	2.3	2.3	4.0	3.0	3.7	3.3	3.0	3.7	3.30	50M	5.0	1.7
CX7161	A.Ch.	52	178	67	19	4.0	3.3	3.3	3.7	1.4	4.7	3.7	3.3	4.0	3.3	3.3	3.62	80H	5.0	1.7

Listed in Order of % Marketable

5 = Most Desirable, 4 = Good, 3.7 = Average

Marketable t/ha: 56 t/ha = 1000 bushels/a

LONG TERM AVERAGE OF CARROT CULTIVARS - PROCESSING TYPES

Cultivar	Source	# Years Tested	Marketable Yield t/ha	Marketable Yield T/A	Colour	Score
Berlicum Bierma	NZ	3	64.0	28.5	4.23	3.84
Camden	Sto	6	83.1	37.0	4.15	4.00
Dess Dan	Sto	14	81.0	36.1	4.12	3.96
Danvers Gold	A.Ch.	2	73.4	32.7	4.12	3.88
Tahoe	NK	3	73.7	32.8	4.10	3.98
Spartan Bonus	Sto	11	75.0	33.4	4.08	3.94
Spartan Bonus 80	Asg	9	73.5	32.7	4.07	3.93
A&C 126	A&C	3	71.3	31.8	4.03	3.92
Spartan Delux	Jung	6	69.0	30.7	4.00	3.92
Casey	Asg	5	66.4	29.6	4.00	3.93
Processor II	Sto	7	96.5	43.0	3.99	3.84
Lucky's Gold	A.Ch.	4	52.9	23.6	3.99	4.20
All Season Cross	Tak	4	76.0	33.8	3.95	3.84
XPH 985	Asg	4	81.0	36.1	3.94	3.80
Mark II	FM	8	80.9	36.0	3.94	3.81
Giant 114	PES	6	89.9	40.0	3.89	3.62
Ch. Red Cored	A.Ch.	6	71.5	31.8	3.88	3.70
Oranza	BEJO	5	79.6	35.4	3.85	3.70
Spartan Premium	Cro	8	73.4	32.7	3.83	3.78
Danvers 126	Asg	12	67.1	29.9	3.77	3.66
Royal Chantenay	Sto	3	76.0	33.8	3.75	3.66
Red Core Chantenay	Asg	9	72.8	32.4	3.66	3.55
Processor IV	Sto	2	70.9	31.6	3.60	3.57
XPH 87W341	Cro	2	96.9	43.2	3.54	3.60
SDC 1374	CS	2	79.4	35.4	3.47	3.35
SDC 1376	CS	2	97.9	43.6	3.45	3.44

Listed in Order of Colour **5 = Most Desirable,** **4 = Good,** **3.7 = Average**

LONG TERM AVERAGES - CARROT CULTIVAR STORAGE TRIAL - PROCESSING TYPES

Cultivar	Source	# Years Tested	% Marketable	% Weight Loss In Storage	% Decay	Degree* of Decay
Spartan Premium	Sto	2	89.2	8.0	2.8	4.5
Danvers Gold	Jung	3	87.4	8.1	4.5	3.8
Dess Dan	Sun	10	84.9	8.5	6.6	3.5
Spartan Winner	Sto	3	84.1	9.3	6.6	3.1
XPH 985	Asg	3	83.2	8.7	8.1	3.2
Spartain Bonus 80	Asg	8	82.1	8.7	9.1	3.3
Red Cr. Chantenay	Asg	5	81.3	7.1	11.6	3.1
Camden	Sto	6	79.4	8.0	12.6	3.4
XPH 875	Asg	3	79.3	10.7	10.0	2.4
Mark II	FM	3	77.6	4.8	17.6	2.8
A&C 126	A&C	3	76.7	11.0	12.3	3.3
Triple Gold	Jung	3	76.0	9.7	14.3	3.8
King Midas	FM	2	76.0	9.5	14.5	3.0
Processor II	Sto	6	75.6	7.8	16.6	3.2
Casey	Asg	4	75.2	9.0	15.5	3.5
Oranza	BEJO	4	74.5	6.6	18.1	2.8
Flamant	NZ	2	74.5	6.5	19.0	3.4
Midas Touch	FM	3	74.1	10.3	15.6	3.5
Gold King	NK	3	71.7	6.3	22.0	3.7
Lucky's Gold	Jung	2	71.5	12.0	16.5	3.4
Giant 114	PES	6	71.3	8.2	20.5	3.3
Danvers 126	Asg	6	69.0	7.2	23.8	2.7
Chantenay Red Cr.	A.Ch.	3	67.7	11.3	21.0	3.3
Tahoe	NK	2	67.0	13.5	19.5	3.0

Listed in Order of % Marketable

* 5.0 = No Disease, 3.7 = Moderate, 1.0 = Severe (liquidified)

Storage Period: 8 months

CARROT CULTIVAR STORAGE TRIAL 1990-91 - PROCESSING TYPES

Cultivar	Source	% Marketable	% Weight Loss In Storage	% Decay	Degree** of Decay
Hybrid B RWC 851	Asg	89.1 a*	6.7	3.7 a	3.5
Berlikumer Corona	Agri	81.7 a	6.7	11.0 a	3.0
Average		85.4	6.7	7.4	3.3

Listed in order of % Marketable

* Numbers in a column followed by the same letter are not significantly different at P = 0.05, Protected L.S.D. Test.

** 5.0 = No Disease, 3.7 = Moderate, 1.0 = Severe (liquidified)

Harvested on October 22/90 and placed in Filacell cold storage at a relative humidity of 95%. Temperature in storage was maintained at 1°C.

3 replications Judged: March 8, 1991

Total Storage Period: 19.5 weeks

LATE CELERY CULTIVAR TRIAL - 1991

MANAGEMENT PROCEDURES

Seeded: On May 5, nine cultivars were seeded in black plastomer seedling trays (200 cells) filled with Pro-Mix G at 2-4 seeds/cell. The cultivars were thinned to 1 plant/cell at the 1st true leaf.

Fertilizer: Greenhouse - 15 applications of 20-20-20 at a rate of 3.1 kg/1000 L water.
- 1 application of 10-52-10 at a rate of 3.1 kg/1000 L water.

Field - 265 kg/ha ammonium sulfate (21%) + 20 kg Borax (14%)
- 2 side dressings of 100 kg/ha ammonium nitrate (33%)

Transplanted: Three replications were planted in the field on July 9 at a spacing of 55 cm X 15 cm.

Weed Control: 1 application of 2.25 kg/ha Gesagard 15 days after transplanting.

Insect & Disease Control: According to IPM recommendations.

Minor Elements: 7 foliar sprays of 9 kg/ha Epsom Salts
7 foliar sprays of 5 kg/1000 L Calcium Nitrate
7 foliar sprays of 2.25 L/ha Foli-Gro

Harvest: Harvest and evaluation took place September 13, September 20 and September 27. Five stalks were cut per replicate per date.

Marketable t/ha: The weight after the stalks were trimmed and cut to a length of 36 cm (14").

% 24's: The percentage of stalks which weighed greater than or equal to 1.0 kg.

Nodal Cracking: Horizontal cracking on or below the nodes which is not caused by Boron deficiency.

LATE CELERY CULTIVAR - MAIN TRIAL - 1991

Cultivar	Source	Harvest Date	Marketable t/ha	% Trim Loss	% 24's	% 30's	% Hearts	Petiole Length	Total Length (cm)	Diameter (cm)	Compactness	Boran Deficiency	Nodal Cracking	Yellow Leaves	General Rating	Score
Ventura	Sto	Sept 13	110	34	27	73	0	31	79	9.1	4.4	4.9	4.8	4.0	4.0	4.43
Ventura	Sto	Sept 20	129	35	60	40	0	30	79	10.7	3.7	4.1	4.6	4.2	3.9	4.09
Ventura	Sto	Sept 27	125	36	60	27	13	29	78	9.7	3.7	3.8	4.9	3.8	3.8	4.00
Bishop	HM	Sept 13	88	29	0	33	67	27	65	7.9	4.3	4.9	4.7	4.7	4.7	4.66
Bishop	HM	Sept 20	117	31	47	40	13	28	70	9.8	4.1	4.3	4.6	4.0	4.2	4.24
Bishop	HM	Sept 27	116	35	47	47	6	29	74	9.7	4.2	4.1	4.6	4.2	4.2	4.25
Matador	Ris	Sept 13	86	41	0	47	53	31	73	8.3	3.6	4.7	4.8	4.7	3.8	4.31
Matador	Ris	Sept 20	105	32	27	60	13	29	69	8.9	3.3	4.8	4.6	4.2	4.1	4.19
Matador	Ris	Sept 27	115	40	60	20	20	32	71	9.8	3.7	4.0	4.2	3.8	3.9	3.91
Picador	Ris	Sept 13	88	38	6	47	47	31	84	8.4	4.3	4.8	4.9	4.8	4.4	4.65
Picador	Ris	Sept 20	107	37	33	53	14	79	80	9.2	4.3	4.7	4.6	4.3	4.3	4.44
Picador	Ris	Sept 27	114	36	33	60	7	32	80	9.5	4.0	4.3	4.6	4.0	4.1	4.20
Utah 5270 HK	Sieg	Sept 13	90	30	7	40	53	28	69	8.1	4.3	4.9	5.0	4.7	4.3	4.65
Utah 5270 HK	Sieg	Sept 20	95	37	13	60	27	26	67	9.2	4.0	4.5	4.7	3.8	4.1	4.21
Utah 5270 HK	Sieg	Sept 27	114	37	47	40	13	27	70	9.5	3.8	4.4	4.5	3.3	4.1	4.03
Starlet	A&C	Sept 13	84	32	0	40	60	31	71	7.7	4.1	4.8	4.8	4.5	4.3	4.51
Starlet	A&C	Sept 20	104	37	27	60	13	30	71	9.2	3.8	4.3	4.3	3.8	4.1	4.06
Starlet	A&C	Sept 27	112	38	53	47	0	32	71	9.1	3.9	4.3	4.7	3.7	4.1	4.13

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LATE CELERY CULTIVAR - MAIN TRIAL - 1991 - continued

Cultivar	Source	Harvest Date	Marketable t/ha	% Trim Loss	% 24's	% 30's	% Hearts	Petiole Length	Total Length (cm)	Diameter (cm)	Compactness	Boran Deficiency	Nodal Cracking	Yellow Leaves	General Rating	Score
Deacon	HM	Sept 13	87	32	0	40	60	24	70	8.1	4.3	4.9	4.8	4.0	4.2	4.44
Deacon	HM	Sept 20	99	33	33	27	40	25	67	9.1	3.8	4.6	4.6	3.8	3.8	4.09
Deacon	HM	Sept 27	110	32	33	67	0	26	67	9.6	3.7	4.2	4.4	3.6	3.9	3.96
Florida 683	Sto	Sept 13	82	32	0	20	80	27	67	8.2	4.4	5.0	4.7	4.7	4.3	4.62
Florida 683	Sto	Sept 20	108	33	33	53	14	26	66	9.7	3.7	4.8	4.8	4.3	4.1	4.34
Florida 683	Sto	Sept 27	109	35	53	33	14	24	66	10.1	3.7	4.4	4.7	3.5	3.9	4.05
Tall Utah 5270	NUM	Sept 13	81	34	0	33	67	27	67	7.3	4.4	5.0	4.8	3.9	4.1	4.45
Tall Utah 5270	NUM	Sept 20	89	37	0	47	53	26	65	8.3	3.8	4.4	4.7	3.3	3.4	3.93
Tall Utah5270	A&C	Sept 27	97	43	7	60	33	28	69	8.9	3.9	4.6	4.7	3.5	3.7	4.06

Listed in Order of Highest Marketable t/ha

5 = Most Desirable, 4 = Good, 3.7 = Average

Marketable t/ha: 67 t/ha = 1000 cartons/a

LETTUCE CULTIVAR TRIALS - 1991

MANAGEMENT PROCEDURES

Fertilizer: 265 kg/ha ammonium sulfate (21%) to 20 kg/ha Borax (14%)

Seeded: May 10 at 40 seeds/m. Main Trials replicated three times. Adaptation Trials, no replications.

Row Spacing: 40 cm x 30 cm

Thinning: May 29

Head	-	Plants spaced 30 cm apart.
Romaine	-	Plants spaced 20 cm apart.
Boston	-	Plants spaced 20 cm apart.

Insect and Disease Control: According to IPM recommendations.

Harvest: Harvest and Evaluation took place according to the maturity of each replicate.

LETTUCE CULTIVAR MAIN TRIAL - 1991

Cultivar	Source	Days to Harvest	Lettuce Type	Weight/Carton 18 Heads (kg)	% Marketable	Reason Non-Marketable	Diameter (cm)	Height (cm)	% Tipburn	% Bottom Rot	Firmness	Uniformity	Internal Stem Length (cm)	Overall Rate
FM 1956	FM	61	HD	13.4	93	br	13.6	-	3.2	10.0	3.4	3.3	4.0	3.4
Green Towers MTD	HM	53	ROM	9.9	100	-	13.1	26.3	4.2	-	4.3	4.2	2.8	4.3
Major Cos	Ris	53	ROM	7.5	80	s	9.5	25.0	4.7	3.3	3.6	3.5	3.1	3.8
Volcan (SLE 9401)	Sak	49	LEAF	5.2	97	-	12.8	23.7	5.0	6.7	-	4.4	7.7	4.4
Genecorp Green Leaf	Ris	49	LEAF	6.1	50	seed	12.6	21.7	3.7	10.0	-	4.2	9.0	3.7

5 = Most Desirable, 4 = Good, 3.7 = Average

Weight/Carton 18 Heads: 18 kg = 40 lbs.

Reason Non-Marketable: s = soft
seed = seeders
br = bottom rot

Lettuce Type: HD = Head Lettuce
ROM = Romaine
LEAF = Leaf Lettuce

LETTUCE CULTIVAR ADAPTATION TRIAL - 1991

Cultivar	Source	Days to Harvest	Weight/Carton 18 Heads (kg)	% Marketable	Reason Non-Marketable	Diameter (cm)	Height (cm)	% Tipburn	% Bottom Rot	Firmness	Uniformity	Internal Stem Length (cm)	Overall Rate	Comments
Head Lettuce														
FM 2026	FM	67	15.4	100	-	14.6	-	4.0	-	4.7	3.3	6.0	3.7	
Etna	Sto	-	-	-	-	-	-	-	-	-	-	-	-	Poor germination
45-65 RZ	ZW	67	14.2	70	br	14.6	-	4.3	10.0	3.3	3.7	13.0	3.3	Internal stem, deep green
Romaine														
Bambi	ZW	50	3.7	100	-	12.0	12.5	3.3	-	-	5.0	4.5	4.3	Compact plants
Butterhead														
Red Boston	Sto	-	-	-	-	-	-	-	-	-	-	-	-	Poor germination
Chantal RZ	ZW	-	-	-	-	-	-	-	-	-	-	-	-	Poor germination
Elvira RZ	ZW	-	-	-	-	-	-	-	-	-	-	-	-	Poor germination
Leaf Lettuce														
Grand Rapids	Sto	50	4.1	70	s	12.2	20.0	3.7	10.0	-	3.3	5.5	3.7	Pale colour
Red Fire M.I.	Sto	50	4.1	100	-	13.4	16.0	5.0	50.0	-	4.7	3.0	4.7	
Royal Green M.I.	Sto	50	4.0	60	seed	12.7	20.0	4.0	20.0	-	4.0	7.0	4.0	
Waldmann's Dark Green M.I.	Sto	50	0.4	40	seed	13.5	21.0	4.3	10.0	-	4.0	9.0	4.0	Cut to old
Raisa RZ	ZW	50	4.1	100	-	13.2	14.0	5.0	-	-	4.3	4.5	4.3	Nice leafy plants

5 = Most Desirable, 4 = Good, 3.7 = Average

Weight/Carton 18 Heads: 18 kg = 40 lbs.

Reason Non-Marketable: s = small
br = bottom rot
seed = seeder

ONION CULTIVAR TRIALS - 1991

MANAGEMENT PROCEDURES

Fertilizer: 300 kg/ha ammonium nitrate (33%) + 20 kg copper sulphate

Seeded: All trials were seeded April 27 and 29 at 43 seeds/m, in rows spaced 43 cm apart. A V-belt seeder equipped with a 5 cm wide scatter shoe was used. The seed was coated with Pro-Gro at 60 g/2.3 kg seed plus Methyl Cellulose at 100 ml/2.3 kg seed. Lorsban 15G was applied at 18.5 kg/ha in the seed furrow. Main Trial was replicated three times. Adaptation and Observation Trials were not replicated.

Weed Control: Pre-emergence: 1 application of 2.5 L/ha Gramoxone
Post-emergence: 1 application of 71.25 ml/ha Goal, 1 application of 213 ml/ha Goal, 2 applications of 310 ml/ha Goal, 2 applications of 6.25 L/ha Prowl

Minor Elements: 6 foliar sprays of 1.5 kg/ha Tecmangam

Insect and Disease Control: According to IPM recommendations.

Sprout Inhibition: MH 60 SG was applied at 3.75 kg/ha in 550 L/ha water on August 20.

Harvest: The trials were pulled on September 3 and 9 and topped on September 10 and 16. The samples were placed in a forced air and temperature controlled storage.

EVALUATION

All trials were evaluated October 9 after 4 weeks of artificial curing and storage.

Marketable Yield: # 1 smalls (32-44 mm) and # 1 large (over 44 mm)

Weight/Bulb (g): The total weight in grams of all bulbs divided by the total number of bulbs.

Skin Thickness: 5 = Most Desirable, 4 = Good, 3.7 = Average

Score: The average of seven marks from Firmness B to Neck Finish.

NOTE: An Observation Trial of 7 numbered cultivars was grown for the benefit of the breeders. Evaluation was done by the breeders.

ONION CULTIVAR MAIN TRIAL - 1991

Cultivar	Source	Days to Harvest	Stand/Meter	Marketable Yield t/ha	Marketable Yield b/a	% No. 1 Smalls	% Non-Marketable	Weight/Bulb (g)	Firmness A	Firmness B	Uniformity Size	Uniformity Shape	Colour	Skin Thickness	Skinning	Neck Finish	Score
Autumn Keeper	Cro	114	13	54	954	2	4	184	4.7	3.9	3.8	3.4	3.4	3.7	3.7	4.7	3.77
Early Pak	Cro	117	22	64	1141	2	7	139	4.8	3.3	3.4	3.6	3.8	3.7	3.7	4.5	3.78
Sweet Sandwich	Cro	125	17	51	901	3	2	134	4.4	3.4	3.4	2.9	3.3	3.3	3.7	3.4	3.34
Advancer	HM	105	25	60	1073	4	1	107	4.8	3.3	3.9	4.1	3.9	3.8	3.7	5.0	4.06
Guardian	HM	113	21	60	1072	1	5	138	5.0	3.5	4.1	3.9	3.4	3.9	3.8	4.4	3.92
Hustler	HM	109	17	50	890	3	5	140	4.4	3.6	3.4	3.7	3.7	3.3	4.3	4.6	3.83
RS 91223 F1	RS	115	17	66	1178	1	4	184	4.7	4.0	4.1	3.7	3.6	4.3	4.1	4.1	3.98
Capable	Sun	118	12	45	792	0	5	179	4.8	3.8	3.7	3.7	3.6	3.4	3.8	4.1	3.71
Duration	Sun	127	13	55	972	0	3	197	4.6	3.3	4.2	3.8	3.3	3.6	3.9	4.0	3.79
New York Early	Sun	121	10	46	822	0	15	247	4.4	2.9	3.3	2.9	2.9	4.1	2.8	3.8	3.29
Paragon	Sun	113	21	61	1079	2	2	134	4.9	3.8	3.4	3.7	3.6	3.8	3.4	4.4	3.73
Clipper	VDH	118	28	69	1221	3	5	116	4.7	3.8	3.8	3.8	3.8	3.3	3.8	4.3	3.79
Django	VDH	119	26	66	1178	1	4	118	4.5	3.3	3.6	3.8	3.7	3.4	3.9	4.4	3.80
VDH 89573	VDH	112	19	60	1059	1	3	142	4.7	3.9	4.2	4.3	3.7	4.0	4.1	4.8	4.18
T-355	Tak	119	16	50	885	1	2	141	4.7	4.2	3.4	3.7	3.1	4.2	3.9	4.4	3.79
8911	Tak	134	8	42	748	1	11	278	4.8	3.7	4.0	3.5	3.1	4.0	3.5	3.6	3.62

5 = Most Desirable, 4 = Good, 3.7 = Average

Stand/Meter: 33 bulbs/m = 10 bulbs per ft.

Firmness: A = Firmness at harvest
B = Firmness at judging

Weight/Bulb (g): A bulb 51 mm (2") in diameter weighs 70 g
A bulb 57 mm (2 1/4") in diameter weighs 100 g
A bulb 64 mm (2 1/2") in diameter weighs 135 g

ONION CULTIVAR ADAPTATION TRIAL - 1991

Cultivar	Source	Days to Maturity	Stand/Meter	Marketable Yield t/ha	Marketable Yield b/a	% No. 1 Smalls	% Non-Marketable	Weight/Bulb (g)	Firmness A	Firmness B	Uniformity Size	Uniformity Shape	Colour	Skin Thickness	Skinning	Neck Finish	Score
AX-1395	Aris	114	31	78	1383	2	0	112	4.3	4.0	3.7	4.0	3.7	3.7	4.0	4.7	3.97
AX-1399	Aris	111	10	32	577	4	0	148	4.3	4.0	3.3	4.0	4.3	4.0	4.0	5.0	4.10
AX-1430	Aris	111	30	75	1335	5	1	112	4.3	3.0	3.0	4.3	3.7	4.0	3.7	5.0	3.95
AX-1433	Aris	111	27	82	1467	1	0	134	4.3	4.0	4.3	4.0	4.3	3.3	3.7	5.0	4.10
AX-1436	Aris	111	14	54	959	0	1	177	4.7	4.7	4.3	3.7	4.0	3.7	3.3	4.3	3.88
AX-1442	Aris	107	25	69	1232	0	0	122	4.7	3.7	3.7	4.0	4.0	3.7	3.3	4.7	3.90
AX-1468	Aris	111	33	86	1529	5	1	119	4.3	3.7	4.0	4.3	4.3	4.0	4.3	5.0	4.32
AX-1917	Aris	107	33	87	1554	3	4	120	4.7	4.3	4.0	4.3	4.7	3.3	4.0	5.0	4.22
AX-1920	Aris	107	11	44	789	0	2	183	4.3	3.3	4.0	4.3	3.7	4.0	3.0	5.0	4.00
AX-1925	Aris	107	32	66	1177	5	2	94	4.3	4.0	4.3	4.3	3.7	3.3	3.3	5.0	3.98
AX-1929	Aris	107	20	58	1036	3	1	129	4.7	4.0	3.7	4.3	4.0	3.7	4.0	5.0	4.12
AX-2448	Aris	107	17	46	813	1	0	122	4.7	4.3	3.3	3.3	3.3	3.7	3.7	5.0	3.72
AX-2488	Aris	107	30	72	1282	4	5	111	4.0	3.7	3.3	3.7	3.3	3.7	3.3	5.0	3.72
XPH-3723	Asg	114	15	54	968	0	0	164	4.3	4.0	3.0	4.0	3.7	3.3	3.7	5.0	3.78
XPH-3724	Asg	114	19	68	1205	1	2	165	4.3	3.3	3.7	3.3	3.7	3.7	4.3	4.7	3.90
XPH 90113	Cro	114	24	78	1380	1	3	149	4.3	3.7	3.7	4.3	3.7	3.7	4.7	4.7	4.13
XPH 90429	Cro	111	18	61	1077	2	0	152	4.3	3.7	4.0	3.7	3.7	4.0	3.7	4.7	3.97
XPH 90430	Cro	107	19	70	1242	0	3	167	4.7	4.3	3.7	4.0	3.7	3.7	3.7	4.7	3.92
XPH 90431	Cro	107	24	67	1191	2	1	124	4.3	4.3	4.0	4.3	3.7	3.7	4.3	5.0	4.17
FMX 44W4	FM	107	16	57	1015	2	0	163	4.3	3.7	4.3	4.0	3.7	4.0	3.7	5.0	4.12
HMX 2611	HM	107	22	82	1467	0	2	166	4.3	4.7	4.3	4.3	4.0	3.7	4.3	4.7	4.22
EXP 2468	PES	107	25	63	1118	4	1	111	4.7	3.7	4.0	4.0	4.0	3.7	3.7	4.7	4.02
EXP 2469	PES	107	18	57	1011	3	0	143	4.3	3.7	4.0	3.7	3.7	3.7	4.3	5.0	4.07
EXP 2470	PES	111	7	28	500	0	0	182	4.7	4.7	3.7	2.7	3.3	4.3	4.3	5.0	3.88

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ONION CULTIVAR ADAPTATION TRIAL - 1991 - continued

Cultivar	Source	Days to Maturity	Stand/Meter	Marketable Yield t/ha	Marketable Yield b/a	% No. 1 Smalls	% Non-Marketable	Weight/Bulb (g)	Firmness A	Firmness B	Uniformity Size	Uniformity Shape	Colour	Skin Thickness	Skinning	Neck Finish	Score
Copra	Swy	114	16	76	1353	0	3	212	4.7	4.3	4.0	2.0	3.3	3.7	4.3	4.7	3.67
Corona F1	Swy	111	25	76	1351	2	0	131	4.3	3.7	4.3	4.7	3.7	2.3	2.7	4.7	3.73
Spirit	Swy	114	22	89	1575	1	0	177	4.3	3.7	4.3	4.7	3.3	3.3	3.7	4.3	3.93
Bingo	Sto	114	13	53	945	0	3	182	4.3	4.7	3.3	4.0	4.0	4.3	3.3	4.7	3.93
Canada Maple	Sto	114	16	76	1358	0	5	216	4.7	3.7	3.3	3.7	3.7	3.7	3.3	4.3	3.67
Capable	Sto	114	7	29	522	0	15	225	4.3	4.0	4.0	4.3	3.7	4.0	4.0	4.7	4.12
Eskimo	Sto	107	16	54	959	1	1	151	4.3	4.7	3.3	3.7	3.3	3.3	3.0	4.3	3.48
Granite	Sto	116	5	19	344	4	0	162	4.3	3.7	4.3	4.0	3.7	4.0	3.7	5.0	4.12
Lucifer	Sto	114	12	43	757	0	4	160	4.0	4.0	4.0	3.0	4.3	4.0	4.7	4.3	4.05
New York Early	Sto	107	17	55	970	1	14	165	4.0	3.0	4.0	4.0	4.0	3.3	2.7	4.7	3.78
Norseman	Sto	114	22	85	1509	2	1	173	4.0	3.3	3.7	3.0	3.0	3.3	3.0	4.3	3.38
Norstar	Sto	101	15	56	1002	1	6	176	4.0	2.3	3.0	3.3	3.7	3.7	3.3	5.0	3.67
Stokes Ex. II	Sto	104	15	58	1027	2	5	177	4.3	4.0	3.7	4.0	4.0	3.7	4.3	4.0	3.95
Tarmagon	Sto	107	20	57	1011	1	1	126	4.3	4.7	3.7	4.7	3.3	3.7	4.3	5.0	4.12
Wolverine	Sto	111	16	61	1077	1	2	172	4.3	4.7	3.3	3.7	2.7	4.0	4.7	4.3	3.78
Valiant	Sto	114	13	58	1038	0	1	203	4.3	3.7	3.7	4.0	4.0	3.7	3.3	4.7	3.90
Sunex 1486	Sun	114	17	48	854	2	20	153	4.7	3.3	3.0	2.3	3.3	4.0	3.0	4.7	3.38
Sunex 1497	Sun	114	14	59	1045	1	0	182	4.3	4.3	4.0	3.0	3.0	4.3	4.7	5.0	4.00
Sunre 1477	Sun	114	18	63	1123	1	7	167	4.7	4.3	3.7	3.3	3.3	3.0	3.7	4.3	3.55
Sunre 1478	Sun	111	25	74	1314	3	0	132	4.3	4.0	4.0	4.3	3.7	3.3	3.7	5.0	4.00
Eskimo	Tak	107	12	28	500	5	6	106	4.7	3.3	3.0	4.3	3.7	3.0	2.7	5.0	3.62
Norstar	Tak	101	16	49	865	1	0	139	4.0	3.0	3.3	4.0	3.7	3.0	3.0	5.0	3.67
T-355	Tak	116	11	35	619	0	5	151	4.3	4.7	2.7	2.3	2.3	4.3	4.7	4.7	3.50
T-400	Tak	114	5	13	239	1	0	120	4.3	4.3	4.3	4.3	3.7	4.0	4.3	5.0	4.27

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ONION CULTIVAR ADAPTATION TRIAL - 1991 - continued

Cultivar	Source	Days to Maturity	Stand/Meter	Marketable Yield t/ha	Marketable Yield b/a	% No. 1 Smalls	% Non-Marketable	Weight/Bulb (g)	Firmness A	Firmness B	Uniformity Size	Uniformity Shape	Colour	Skin Thickness	Skinning	Neck Finish	Score
6401	Tak	114	13	54	954	0	41	304	4.0	2.3	3.3	4.0	3.0	4.3	2.7	3.7	3.50
6403	Tak	116	16	73	1299	1	6	224	4.7	3.7	3.7	3.7	3.0	4.3	4.0	4.3	3.83
6404	Tak	116	18	118	2104	1	0	289	4.3	2.7	3.7	3.3	3.7	3.7	2.7	4.7	3.63
8911	Tak	114	22	84	1501	1	3	169	4.7	3.0	3.7	3.3	3.3	3.7	3.3	4.0	3.55
VDH 89550	VDH	107	32	77	1363	5	0	106	4.3	3.7	4.3	4.0	3.7	3.3	3.7	4.7	3.95
Athos F1	Vil	107	15	53	936	1	1	159	4.7	4.0	3.7	3.7	3.7	3.7	3.3	4.7	3.80
Burgos F1	Vil	114	10	42	749	2	5	200	4.7	4.3	4.0	3.7	3.7	4.0	3.0	4.3	3.78
RS 63344	RS	114	19	58	1040	4	0	138	4.3	4.3	2.7	2.3	3.7	4.0	4.0	4.7	3.57

5 = Most Desirable, 4 = Good, 3.7 = Average

Stand/Meter: 33 bulbs/m = 10 bulbs per ft.

Firmness: A = Firmness at harvest
B = Firmness at judging

Weight/Bulb (g): A bulb 51 mm (2") in diameter weighs 70 g
A bulb 57 mm (2 1/4") in diameter weighs 100 g
A bulb 64 mm (2 1/2") in diameter weighs 135 g

LONG TERM AVERAGES OF ONION CULTIVARS - 1991

Cultivar	Source	# Years Tested	Marketable Yield t/ha	Marketable Yield b/a	Days to Maturity	Firmness* A	Firmness* B
AX 1955	Aris	2	67.1	1194	103	4.50	3.70
Eskimo	Tak	7	54.5	970	105	4.21	3.69
Norstar	Tak	8	62.4	1111	106	3.90	3.28
Advancer	HM	5	59.8	1064	107	4.18	3.56
Columbia	FM	5	58.6	1043	108	4.30	3.83
Hustler	HM	5	50.2	894	108	4.14	3.62
AX-1917	Aris	2	68.7	1223	109	4.70	4.50
Rocket	Asg	13	54.6	972	109	-	3.82
Simcoe	Sun	9	50.8	904	109	4.10	4.24
Tarmagon	Sto	7	63.9	1137	110	4.34	4.03
XPH 3243	Asg	4	56.4	1004	110	4.33	4.00
Trapp #6	E.J.	12	54.1	963	110	-	4.01
Early Pak	Cro	10	54.3	967	111	3.99	3.93
Taurus	Asg	12	54.0	961	111	-	3.79
Aries	Asg	10	52.3	931	111	4.19	3.93
Trapp #8	E.J.	12	57.7	1027	112	4.40	4.19
Imp. Autumn Spice	Sto	8	45.8	815	112	-	3.78
Capable	Sun	7	58.1	1034	113	4.18	3.76
Guardian	HM	5	57.7	1027	114	4.30	3.90
Paragon	Sun	4	66.4	1182	115	4.58	4.05
Hi Score	E.J.	4	54.1	963	115	4.48	3.88
Bronze Reserve	FM	4	48.5	863	115	3.98	3.78
Bingo	Sto	4	63.5	1130	116	4.45	4.23
Canada Maple	Sto	17	57.2	1018	116	-	4.18
Clipper	VDH	5	56.6	1007	116	4.20	3.74
VDH 89573	VDH	2	73.8	1314	117	4.70	4.10
Sweet Sandwich	PETO	7	69.0	1228	117	3.80	3.86
Sassy Brassy	FM	2	65.4	1164	117	4.03	3.42

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LONG TERM AVERAGES OF ONION CULTIVARS - 1991 - continued

Cultivar	Source	# Years Tested	Marketable Yield t/ha	Marketable Yield b/a	Days to Maturity	Firmness* A	Firmness* B
Bronze Age	FM	6	60.8	1082	117	-	3.38
Autumn Keeper	JHK	8	53.7	956	117	-	4.09
Spartan Sleeper	PES	4	61.4	1093	118	-	4.11
Sunex 1497	Sun	2	60.4	1075	118	4.50	4.50
6404	Tak	2	96.1	1711	119	4.30	3.20
8911	Tak	2	83.2	1481	119	4.35	3.60
Sunex 1486	Sun	3	52.2	929	119	4.57	3.67
Flame	Asg	2	71.0	1264	120	4.00	3.42
Cuprum	Sun	5	64.2	1143	120	-	3.92
Sentinel	HM	12	58.4	1040	120	-	4.22
T-355	Tak	2	51.4	915	120	4.70	4.45
HXP 2621	HM	3	48.2	858	120	-	3.93
Copra	BEJO	6	66.8	1189	121	4.39	4.08
Suntan	SWY	3	61.9	1102	121	4.33	3.70
RS 91223F1	RS	2	64.6	1150	122	4.40	4.00
Gilbraltar	FM	2	59.7	1063	122	-	4.25
Superior	A&C	3	60.6	1079	125	-	3.56
Spartan Banner	A&C	6	62.1	1105	126	-	3.77

Listed in Order of Days to Maturity

* Firmness: A = Evaluated at Time of Harvest
B = Evaluated After Artificial Curing
5 = Most Desirable, 4 = Good, 3.7 = Average

LONG TERM AVERAGES OF ONION CULTIVAR STORAGE TRIALS - 1991

Cultivar	Source	# Years Tested	% Weight Loss in Storage	% Rot, Soft & Sprouts by Weight	% Marketable by Weight	Firmness* A	Firmness* B
Super Spice II	Sto	2	9.9	2.3	87.8	4.10	3.55
Paragon	Sun	4	8.9	4.7	86.4	4.45	4.00
Copra	BEJO	5	8.6	5.7	86.2	4.30	4.08
Bingo	Sto	3	8.7	5.5	85.5	4.40	3.83
Suntan	Swy	3	8.7	11.3	85.3	4.33	3.73
Cuprum	Sun	5	10.1	5.0	84.9	4.13	3.64
Simcoe	Sun	5	7.9	7.1	84.8	4.60	4.12
Canada Maple	Sto	9	8.3	8.3	83.3	-	4.13
Taurus	Asg	9	7.3	9.8	82.9	-	3.64
Exporter	Sto	3	8.7	9.2	82.1	-	3.63
Hi Score	E.J.	3	10.0	8.3	82.1	4.30	3.43
Citadel	Asg	2	8.5	9.0	82.0	4.30	3.45
Sweet Sandwich	PES	7	10.2	9.8	81.0	3.79	3.23
Sentinel	HM	8	9.9	9.8	80.3	-	4.17
Mucker	Sun	6	8.3	11.5	80.2	-	3.82
Sassy Brassy	FM	3	11.0	9.0	80.0	4.03	3.13
Trapp #8	E.J.	9	8.9	11.3	79.9	-	3.81
Hustler	HM	4	8.7	12.1	79.4	4.05	3.25
Exporter II	Sto	2	10.5	10.5	79.0	4.15	2.95
Capable	Sun	5	8.9	12.8	78.4	4.08	3.30
Columbia	FM	4	10.9	11.1	77.8	4.28	3.30
Autumn Pride	E.J.	3	8.0	14.7	77.3	-	3.33
Advancer	HM	3	9.4	13.8	77.2	4.03	3.35
Trapp #6	E.J.	5	8.6	14.3	77.1	-	4.02

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LONG TERM AVERAGES OF ONION CULTIVAR STORAGE TRIALS - 1991 - continued

Cultivar	Source	# Years Tested	% Weight Loss in Storage	% Rot, Soft & Sprouts by Weight	% Marketable by Weight	Firmness* A	Firmness* B
Fortress	Asg	2	10.5	12.0	77.0	4.35	3.55
Bronze Reserve	FM	3	12.1	11.0	76.9	3.97	2.93
Tarmagon	Sto	4	9.5	15.9	74.6	4.27	3.28
Tamarack	Sto	4	9.0	16.7	74.3	-	3.83
Eskimo	Tak	5	9.5	17.0	73.5	4.13	3.50
Superior	A&C	2	10.5	16.0	73.5	4.00	3.30
Flame	Asg	4	10.2	16.9	72.9	4.00	2.98
HMX 2621	HM	2	16.8	13.4	69.8	4.05	3.65
Norstar	Tak	7	10.2	35.5	49.7	3.40	2.57

Listed in order of % Marketable **Storage Period: 10 months**

* **Firmness:** A = At Harvest
B = At End of Storage
5 = Most Desirable, 4 = Good, 3.7 = Average

ONION CULTIVAR STORAGE TRIAL - 1990-91

Cultivar	Source	% Weight Loss	% Sprouts	% Rot	% Soft	% MKB.		Firmness** Sept. 90	Firmness** Aug. 91
AGX 189	HY	7.8	0.8	0.7	0.0	90.7	a*	4.3	4.4
XPH 3660	Asg	8.0	1.7	0.6	0.0	89.4	ab	4.2	4.0
Guardian	HM	9.5	1.6	0.7	0.0	88.2	abc	4.7	4.1
RS 91223	RS	9.8	1.1	1.7	0.0	87.8	abc	4.1	3.7
XPH 3725	Asg	9.4	2.5	0.7	0.0	87.3	abc	4.5	4.3
Paragon	Sun	9.6	2.8	0.5	0.2	87.3	abc	4.7	4.3
XPH 3724	Asg	8.4	3.9	1.3	0.4	86.3	abcd	4.6	4.0
Early Cream Gold	FAIR	11.1	2.8	2.7	0.0	84.2	abcd	4.9	4.7
Clipper	VDH	9.1	4.0	1.7	0.3	84.2	abcd	3.6	3.3
Simcoe	Sun	8.3	6.4	0.4	0.0	84.1	abcd	4.6	4.1
RS 91222	RS	9.8	5.4	0.7	0.2	84.0	abcd	4.4	3.6
Sweet Sandwich	A.Ch.	9.7	5.1	1.6	6.7	84.0	abcd	4.1	3.1
XPH 3723	Asg	9.3	5.9	1.4	0.0	84.0	abcd	4.6	4.1
Hi Score	E.J.	9.0	9.2	0.6	0.0	82.4	abcde	4.3	4.0
Advancer	HM	10.1	7.8	1.2	1.3	80.6	bcde	3.8	3.3
Capable	Sun	8.9	8.8	1.0	1.6	80.5	bcde	4.1	3.6
Sunglow	Cro	11.1	9.3	1.3	1.3	78.5	cde	3.6	3.1
AGX 281	HY	8.9	14.6	0.6	0.0	77.4	de	4.1	3.9
Hustler	HM	9.3	14.0	1.2	0.3	76.8	de	3.6	3.1
Early Pak	Cro	10.4	17.9	0.8	0.3	72.6	ef	3.9	3.0
New York Early	Sun	10.4	22.0	0.6	4.2	65.4	f	3.8	2.7
AGX 205	HY	18.3	21.2	8.3	0.5	57.2	g	3.8	2.0
AGX 210	Hy	21.5	21.8	13.8	2.3	48.7	g	3.6	2.4
Norstar	Tak	12.9	41.0	1.2	2.0	48.6	g	3.4	2.5
Average		**10.4**	**9.7**	**1.9**	**0.9**	**78.8**		**4.1**	**3.6**

Listed in order of Percent Marketable

Storage Period: 46 Weeks

* Numbers in a column followed by the same letter are not significantly different at P = 0.05, Protected L.S.D. Test.

** 5.0 = Most Desirable, 3.7 = Average, 1.0 = Least Desirable

TRANSPLANTED SPANISH ONION CULTIVAR TRIAL - 1991

MANAGEMENT

Seeded: On March 26, 27 and 28, twenty cultivars were seeded in black Plastomer seedling trays (200 cells) filled with Pro-Mix G at 2 seeds/cell. The cultivars were thinned to 1 plant/cell at the 2 true leaf stage. They were clipped regularly to a height of 12 cm to promote sturdy plants.

Fertilizer: Greenhouse - 5 applications of 20-20-20 at a rate of 3 kg/1000 L water.
- 1 application of 10-52-10 at a rate of 3 kg/1000 L water.
Field - 300 kg/ha of ammonium nitrate (33%) + 20 kg copper sulfate.

Transplanted: Three replications were planted in the field on May 14 at a spacing of 43 cm X 12 cm. A tray drench of Lorsban 4E was applied at 1.6 ml product per 475 ml water per tray 2 days before transplanting on May 8.

Weed Control: Pre-emergence: 1 application of 2.5 L/ha Gramoxone
Post-emergence: 1 application of 71.25 ml/ha Goal
1 application of 142 ml/ha Goal, 1 application of 213 ml/Goal, 2 applications of 310 ml/ha Goal, 2 applications of 6.25 L/ha Prowl.

Minor Elements: 6 foliar sprays of 1.5 kg/ha Tecmangam

Insect and Disease Control: According to IPM recommendations.

Sprout Inhibition: MH 60 SC was applied at 3.75 kg/ha in 550 L/ha water on August 20.

Harvest: On September 17, all cultivars were pulled, topped by hand, and placed in a forced air and temperature controlled storage to mechanically cure the bulbs. The temperature was set at 28°C. The relative humidity varied form 30% to 60%.

EVALUATION

Evaluation was done on October 30 and 31 after 6 weeks in storage.

Maturity Date: Date when 85% of the tops were done.

% Marketable: Onions over 45 mm in diameter.

Weight/Bulb (g): The weight of all bulbs divided by the total number of bulbs.

 # Rings Over 3 cm: The total number of complete rings over 3 cm diameter in 10 bulbs.

Score: The average of the 6 marks from Uniformity to Neck Finish.

SPANISH ONION CULTIVAR TRIAL - 1991

Cultivar	Source	Maturity Date	Marketable Yield t/ha	Marketable Yield b/a	% Marketable		Weight/Bulb (g)	% Single Centers	# of Rings Over 3 cm	Uniformity Size	Uniformity Shape	Firmness	Colour	Skinning	Neck Finish	Score
Valiant	Sun	Aug.14	83	1474	96.5	a*	444	10	42	3.7	3.8	3.9	3.9	3.9	4.3	3.91
Bravado	Sun	Aug.24	100	1778	94.3	a	538	7	42	3.9	4.1	3.4	4.2	4.2	4.6	4.07
Magnum	Sun	Aug.12	83	1477	91.2	ab	448	8	44	3.9	3.3	3.5	4.0	3.9	4.5	3.84
Winner	Sun	Aug.18	93	1659	90.1	ab	518	8	44	3.8	4.0	3.4	4.2	2.9	4.2	3.76
Oro Grande	FM	Aug.19	77	1374	90.1	ab	495	14	40	3.8	3.9	3.6	3.9	3.2	4.3	3.78
Armada	Asg	Aug.16	92	1643	89.8	ab	497	8	46	4.2	3.8	2.9	3.9	3.6	4.1	3.74
Maya	Asg	Aug.10	83	1485	89.3	ab	467	3	43	4.0	4.1	3.6	3.7	3.3	4.2	3.81
Bullring	Sun	Aug.10	81	1435	89.2	ab	452	7	37	4.0	4.2	3.9	4.3	4.1	4.3	4.13
9001	Tak	Aug.23	99	1766	89.0	abc	558	3	41	4.2	4.0	3.8	3.7	3.2	4.5	3.89
Vega	Asg	Aug.19	96	1703	88.4	abc	515	6	46	4.2	3.9	3.8	3.6	3.8	4.0	3.88
Cache	Asg	Aug.10	82	1463	88.4	abc	472	15	40	3.9	3.6	3.6	4.0	3.5	4.2	3.78
Golden Cascade	Sun	Aug.15	74	1314	88.2	abc	441	2	43	4.1	3.6	3.7	3.8	3.2	4.4	3.79
Valdez	Sun	Aug.26	97	1721	86.9	abcd	576	10	43	4.1	4.0	3.3	3.8	3.8	4.0	3.83
Brahma	Sun	Aug.11	70	1244	82.5	bcde	424	7	42	3.9	4.0	4.1	4.1	3.8	4.3	4.03
Kelsae Sw. Giant	Sto	Aug.19	93	1648	82.0	bcde	556	0	32	3.5	3.7	2.4	2.0	2.3	3.7	2.93
Cima	Sun	Aug.18	69	1223	79.7	cde	471	6	43	3.7	3.5	3.9	4.0	4.0	4.3	3.89
Ringmaker	Sto	Aug.17	72	1276	78.2	cde	416	5	40	3.5	3.4	3.2	3.4	3.6	4.3	3.58
Planet	W.H.P.	Sept.1	87	1545	76.7	de	546	0	43	4.1	3.2	3.4	3.8	3.7	4.3	3.76
Yellow Sw. Span.	Asg	Aug.21	76	1355	76.6	ef	458	0	44	3.7	4.0	3.6	3.8	3.3	3.8	3.69
Yula	Asg	Aug.11	55	983	65.8	f	413	2	40	3.8	3.9	3.2	3.0	2.2	4.8	3.48

Listed in Order of % Marketable. 5 = Most Desirable, 4 = Good, 3.7 = Average

* Numbers in a column followed by the same letter are not significantly different at P = 0.05, Protected L.S.D. Test.

All cultivars received 0.0% on number of seeders.

SPANISH ONION STORAGE TRIAL - 1990-91

Cultivar	Source	% Weight Loss	% Sprouts	% Rot	% Soft	% MKB.	Firmness April, 1991
Brahma	Sun	2.6	1.7	0.0	0.0	95.3 a *	2.9 bcdef
Valiant	Sto	3.2	1.2	3.1	0.0	92.1 ab	3.0 abcd
Bravado	Sun	2.4	3.9	5.2	1.3	86.7 abc	2.7 efgh
Fiesta	Sto	3.4	9.1	1.7	0.0	85.6 abc	3.4 a
Cima	Sun	2.8	3.1	9.3	1.5	82.8 bc	2.8 cdefg
Vega	Asg	2.7	10.1	3.5	1.8	81.8 bc	2.8 cdefg
Valdez	Sur.	3.2	10.4	4.2	0.0	81.0 bcd	2.7 defgh
Aramda	Asg	2.7	0.0	12.1	4.1	80.9 bcd	3.2 abc
Bull Ring	Sun	2.9	3.2	11.5	2.7	79.6 cd	3.3 ab
Maya	Asg	2.9	2.6	9.1	5.7	79.6 cd	2.4 fghi
Cache	Asg	4.2	7.5	5.1	3.6	79.3 cd	2.7 efgh
Magnum	Sun	4.7	5.6	5.2	6.2	77.9 cd	2.2 hi
Winner	Sun	2.5	16.3	3.8	0.0	77.4 cd	3.0 abcde
XPH 85N52	Cro	2.9	9.1	7.6	3.5	76.6 cd	2.6 efghi
Golden Cascade	Sun	2.7	14.2	8.2	1.3	73.3 cd	2.3 ghi
Yula	Asg	6.0	2.9	15.3	15.4	60.2 e	2.0 i
Average		3.2	6.3	6.6	2.9	80.6	2.8

Listed in order of % Marketable

Storage Period: 29 weeks

* Numbers in a column followed by the same letter are not sufficantly different at P = 0.05, Protected L.S.D. Test.

Spanish onions were harvested on Sept. 24/90 and placed in drying storage for 4 days at 28 °C onions were cooled cown to 1°C by December 20/90.

On April 17/91 the Spanish onions were removed from storage and judged for storage quality.

ONTARIO REGIONAL POTATO CULTIVAR TRIAL - 1991

This trial was done in co-operation with Vanessa Currie, University of Guelph, Horticulture Department.

MANAGEMENT PROCEDURES

Fertiliser: 265 kg/ha ammonium sulfate (21%) + 14 kg/ha Borax

Planting: Four replications of 15 cultivars were planted on May 8. The tubers were planted 25 cm apart at a depth of 7 cm and covered with low hilling. Large tubers were cut in half. The rows were spaced 86 cm apart.

Weed Control: Pre-emergence: 1 application of 4.5 kg/ha Lorox

Insect & Disease Control: According to IPM recommendations.

Top Killing: Potatoes died naturally.

Harvest: Harvest was done on September 5 and 6.

1 bushel = 25 kg (55 lbs.)

EVALUATION

Evaluation took place on September 27 and October 1.

Marketable Size: 57 mm to 89 mm (2 1/4" to 3 1/2")

ONTARIO REGIONAL POTATO CULTIVAR TRIAL - 1991

Cultivar	Marketable t/ha	Marketable b/a	Marketable %		% Small	% Over & Culls	Emeregence %	Uniformity**	Comments
Chieftain	16.5	268	63.2	a*	36.5	1.8	99.2	3.2	Red skin. Moderately rough
Norchip	14.1	227	52.9	ab	46.4	0.8	92.7	3.7	White, smooth
G847-2	13.5	218	51.9	abc	46.9	1.3	96.0	4.2	White, smooth
G8160-3R	9.4	152	51.0	abc	46.7	0.3	95.2	4.2	Red, white flesh, scabby
Kennebec	8.1	131	50.6	abc	48.4	1.1	96.0	4.3	White, white flesh, scabby
G8160-6R	8.7	142	47.5	abc	51.2	1.3	96.8	4.0	Red, white flesh, smooth
FTB 872-1	6.5	106	46.4	abc	49.9	1.7	99.2	4.3	
FTB 871-1	5.5	88	44.6	abc	55.1	0.5	96.0	3.1	Pink&white,moderately smooth
G8525-P	10.8	175	44.0	abc	52.4	0.3	90.3	3.0	Purple, oblong, white flesh
6324-1	6.6	108	38.5	abcd	60.9	0.6	96.8	3.7	White, white flesh
G8160-11RY	7.7	124	37.5	abcd	45.2	2.3	96.0	4.4	Red, white flesh, smooth
6438-2	2.7	44	31.9	abcd	66.4	1.7	91.9	3.7	White, white flesh
6588-4	4.2	68	36.2	bcd	63.4	0.2	99.2	3.7	White, white flesh
Shepody	2.2	35	28.8	cd	69.0	2.3	95.2	3.7	White, white flesh, oblong
G7815-9Y	2.4	39	11.8	d	87.3	0.9	98.4	4.2	White, yellow flesh, smooth

Listed in Order of Marketable tonnes per hectare.

* Numbers in a column followed by the same letter are not significantly different at P = 0.05, Protected L.S.D. Test.

** Uniformity = 5 = Most Desirable, 4 = Good, 3.7 = Average

1 bushel = 25 kg (55 lbs.)